OCTOBER 26, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Burroughs' Personnel Ideas Add Up to Efficiency

— see page 82

THE BIG SELL
Accents the Metal Show, p. 71

CORROSION INHIBITORS SCORE
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Here Are Facts You Should Know About Electric Motor Bearings

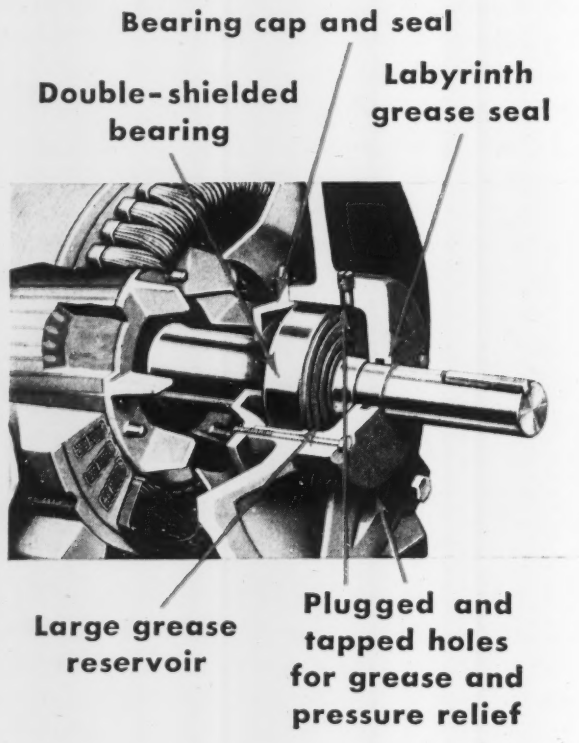
AN ideal motor bearing would operate for indefinitely long periods under all types of conditions without requiring any attention whatever. However, in the opinion of our engineers, such a bearing and its attendant lubricant are not yet available on the commercial market. Consequently, bearings for many types of operations, particularly where overloading, extreme temperature ranges and chemical and dirt laden atmospheres are involved, require special lubricants or regular lubrication schedules.

Of course, bearings suitable for many kinds of operation under normal conditions can be built to require no attention for very long periods — usually several years. Allis-Chalmers can supply sealed bearings in all frame sizes through 505 on short delivery and without extra cost for applications of this type.

Which is the Best Design for *Your* Application?

We believe that the design used in standard Allis-Chalmers drip-proof, tefc and explosion-proof motors represents the best design for most industrial users.

The Allis-Chalmers standard design consists of a pre-lubricated, double-shielded bearing mounted in the end housing with a generous grease reservoir. Plugged and tapped holes are provided for grease and for pressure relief. Under normal operating conditions, this design will operate as long without attention as any other type of bearing in use today. But where difficult operating conditions make re-lubrication desirable, it can be done as part of the normal lubricating routine without dismantling the motor.


Bearing cap and seal
Double-shielded bearing
Labyrinth grease seal
Large grease reservoir
Plugged and tapped holes for grease and pressure relief

The large grease reservoir and shielded bearing design assure that grease lost from the bearing due to high operating temperatures or other causes will be replaced automatically.

For further information on bearing design and other features of Allis-Chalmers motors, call your nearby Allis-Chalmers District Office or Authorized Distributor.

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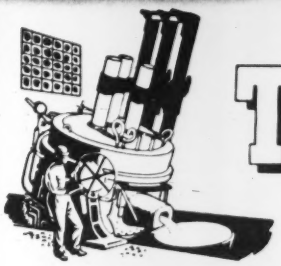
ALLIS-CHALMERS

Milwaukee 1, Wisconsin

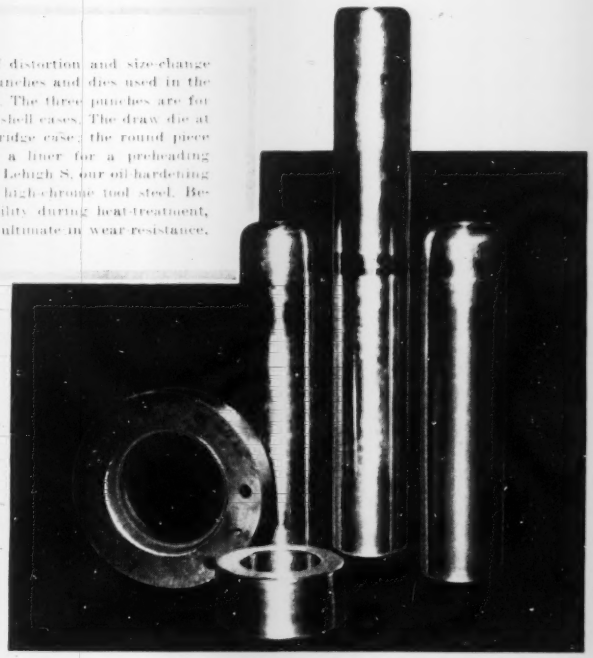


Tool Steel Topics

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Only the minimum of distortion and size-change can be tolerated on punches and dies used in the cold-extruding of steel. The three punches are for cold-drawing 105 mm shell cases. The draw die at left is for a 5 in. cartridge case; the round piece in the foreground is a liner for a preheading die. All are made from Lehigh S, our oil-hardening grade of high-carbon, high-chrome tool steel. Besides its inherent stability during heat-treatment, Lehigh S provides the ultimate in wear-resistance.



There's no such thing as a non-deforming tool steel

Shrinkage, growth, and warpage — all occur when a tool is heated for hardening. There just isn't a tool steel which is "non-deforming" in the absolute sense of the term.

It's downright discouraging when an accurately machined tool or die emerges from the heat-treating furnace with its shape distorted or its dimensions way beyond the allowable tolerances. Yet, this experience is quite common.

In many instances the change in size caused by heat-treatment is not so great as to cause any trouble. Proper grinding, to remove scale and to obtain exact tool dimensions, is often all that is necessary. However, excessive warpage or size change can make it costly, even impossible, to restore a tool to the proper shape or correct dimensions, either by grinding or by corrective heat-treatment.

It's obviously important for both toolmakers and heat-treaters to understand the causes of distortion and how it can be controlled within reasonable limits. The design of tools, the grade of tool steel used, and heat-treatment procedures — all these factors have a bearing on the degree of distortion which will occur.

Warpage, for example, is usually a factor associated with the geometrical shape of a tool and with the thermal stresses produced by lack of uniformity in heating or cooling operations. The composition of a tool steel has very little to do with the occurrence of warpage.

On the other hand, the growth or shrinkage of tools is the result of volume changes caused by the hardening operation. Each grade of steel has certain characteristics of inherent distortion. And it varies considerably with the composition. Carbon tool steel, for example, has a distortion "factor" of approximately .002 to .004 in. on the plus side. A high carbon, high-chromium grade, such as our Lehigh H, has a factor of only .0005 in., plus or minus.

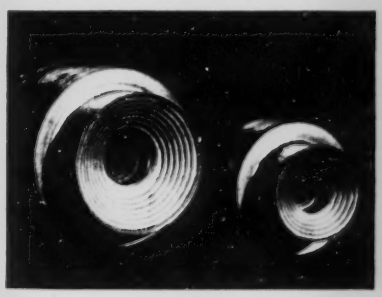
If you'd like a printed discussion of this subject write to our Publications Dept. at Bethlehem, Pa., for the booklet "Distortion of Tool Steels in Heat Treatment."

BETHLEHEM TOOL STEEL ENGINEER SAYS:

Avoid drastic changes of section in tool design

You can expect trouble whenever a tool made of a liquid-quenched steel is designed so that heavy and light sections are adjacent. When such a tool is quenched, the light sections cool rapidly and harden before the adjacent heavy sections. Quenching stresses are set up which often exceed the strength of the steel. Cracking is the result.

Although such tools fail during heat-treatment, poor tool design must take the blame. Troubles of this sort are sometimes avoided by differential hardening or making this type of tool as a two-piece assembly. But if a one-piece construction is necessary, then it's best to use an air-hardening steel.



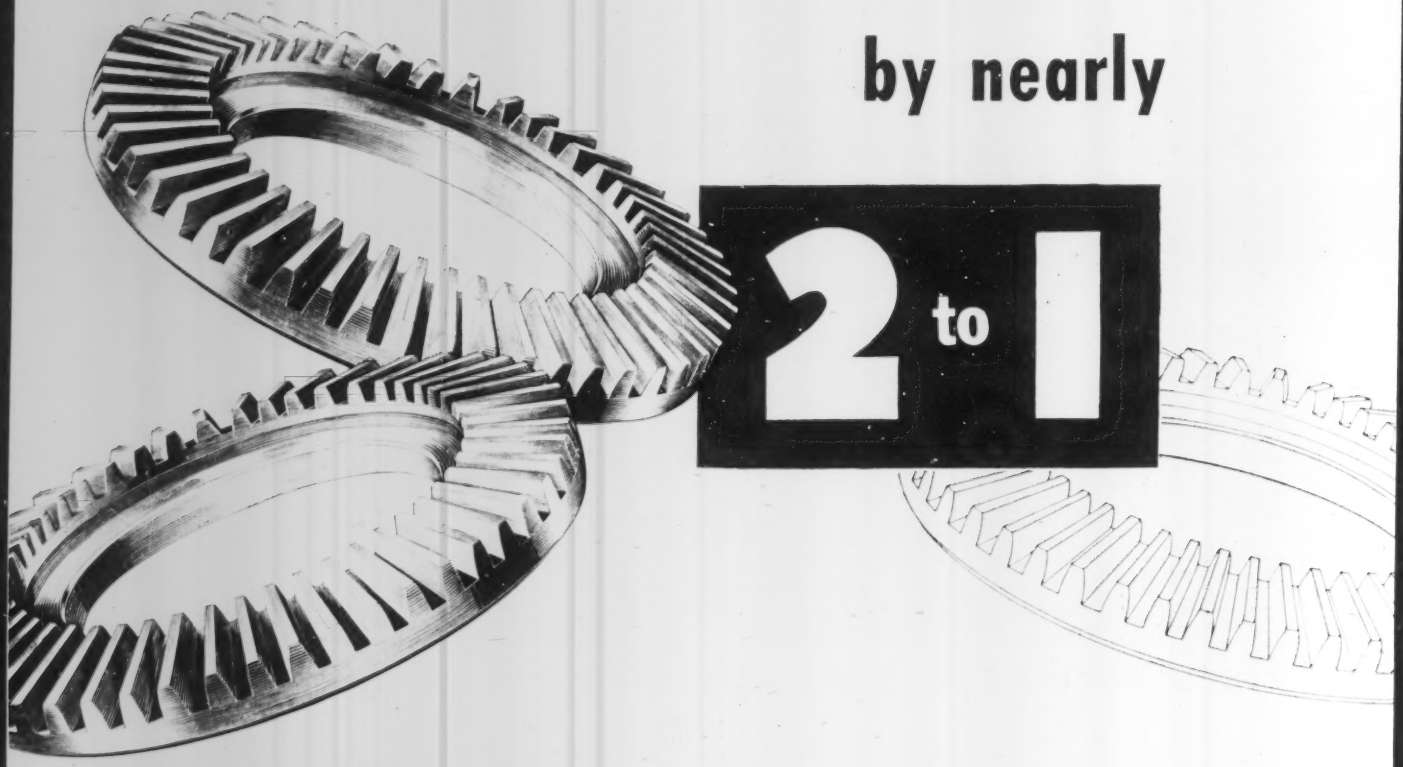
FOR TOOTHPASTE TUBES

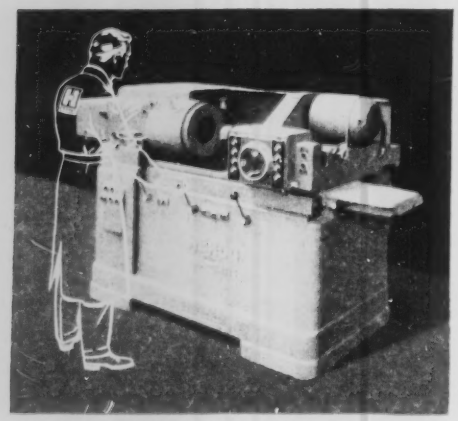
These intricately machined dies are used in shaping the tapered neck and tip of toothpaste tubes which are extruded from round slugs of aluminum. When a punch is driven downward towards the die, the aluminum "biscuit" is trapped between the punch tip and the die and is extruded by the heavy pressure, flowing upwards along the cylindrical punch to form the tube body.

The dies pictured are made from our 6F Chisel tool steel, a chrome-tungsten grade of shock-resisting steel that's ideal for tools and dies requiring **plenty of** impact strength. Although it is principally a shock type of steel, 6F Chisel is readily carburized whenever extra wear-resistance is needed . . . without sacrificing the advantages of its tough core.

Easy to machine and heat treat, 6F Chisel is stocked by distributors of Bethlehem tool steel in principal cities.

Heald Internal outproduces older equipment by nearly





This Heald Model 271 Gage-Matic grinds ring gear bores nearly as fast as two older machines.

THIS might be just another case history, except for one thing — a production increase of almost 100 per cent. And that's a pretty important saving in any production man's language.

A Heald Model 271 Gage-Matic was installed by an automotive manufacturer for grinding the bore of differential ring gears. A simple, straightforward operation — yet it was found that this new Internal out-produced *two* older machines by almost two-to-one! Why? Because all of the new Heald machines have been designed to save time and effort on *every phase* of the operating cycle. It all adds up to a substantial increase in production efficiency.

Remember — when it comes to precision finishing, it pays to come to Heald.

Internal and Rotary
Surface Grinding Machines
and Bore-Matics

HEALD

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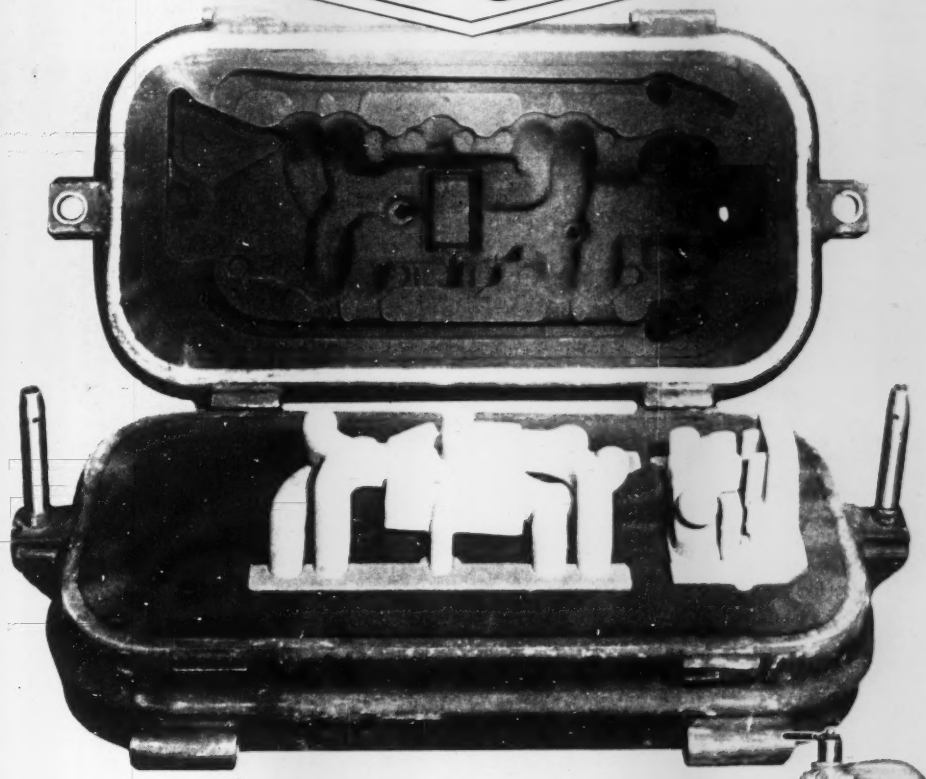
OSBORN



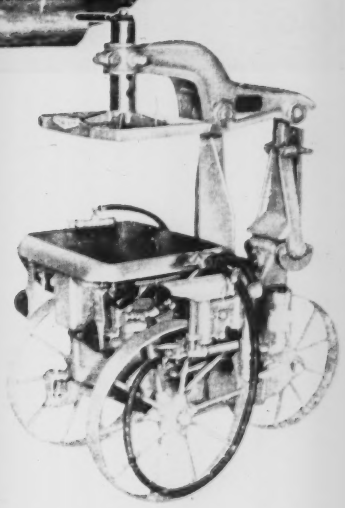
MACHINE MADE MOLDS AND CORES = increased production + accurate castings + lower foundry costs

OSBORN Molding Machines and Core Blowers give you uniform and accurate sand reproductions of your patterns and core boxes. Variations in density and hardness experienced with hand rammed methods are eliminated assuring uniform accurate castings.

With Osborn molding equipment top quality molds and cores are turned out with less operator effort and skill . . . to cut your foundry costs.

To insure top quality castings . . . top production per man-hour, Osborn has a right machine for every foundry molding need. A factory-trained Osborn molding specialist will gladly analyze your requirements and recommend the most efficient equipment from Osborn's complete line.

Write *The Osborn Manufacturing Company, Dept. EE-11, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



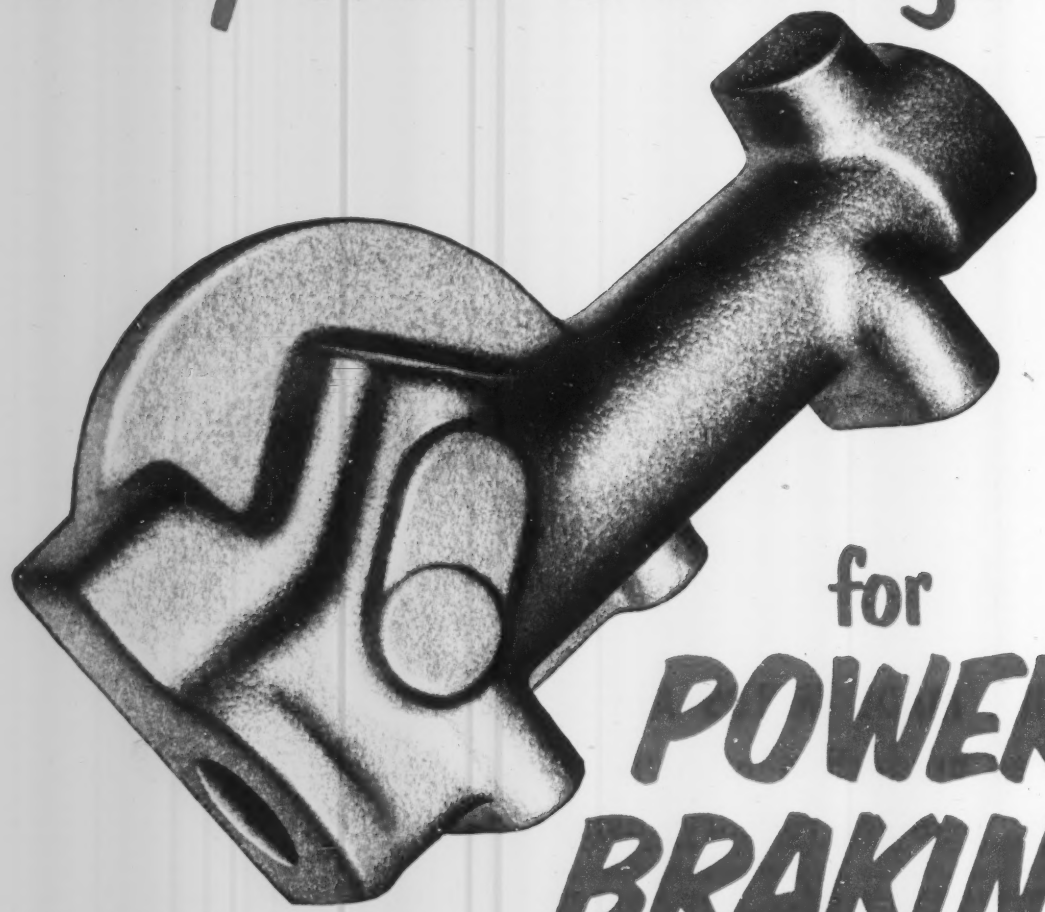
Osborn Jolt Squeezer 275 J. Top performer throughout the foundry industry for accuracy, dependable production, low cost operation.

Serving the Foundry Industry for over 43 Years

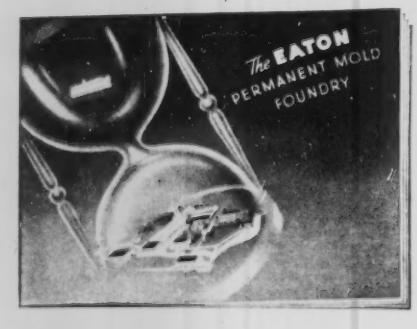
Osborn Molding Machines

MOLDING MACHINES . . . CORE BLOWERS . . . INDUSTRIAL BRUSHES

Eaton Permanent Mold Gray Iron Castings—



for POWER BRAKING



Send for your free copy of the 32-page illustrated booklet: "The Eaton Permanent Mold Foundry." It tells the story of Permanent Mold Castings and takes you on a picture-tour of the Eaton Foundry at Vassar, Michigan.

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This Week in Metalworking

STEEL

Vol. 133 No. 17 October 26, 1953

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There's still a NICKEL SHORTAGE! — BUT

Now you can have bright, attractive, wear-resistant chromium plated finishes *WITHOUT THE USE OF NICKEL*

LUSTER-ON® ZINCROME® PROCESS*

provides *excellent corrosion resistance* — up to 50 hours standard salt spray

LUSTER-ON ZINCROME PROCESS

provides good *wear resistance* — the hardness of chrome plate needed for tools, bumpers, etc.

LUSTER-ON ZINCROME PROCESS

provides *accepted brilliant finish* — for outside wear exposure required for automotive trim, etc.

LUSTER-ON ZINCROME PROCESS

provides *economical operation* — high, rugged quality at lowest possible operating cost

LUSTER-ON ZINCROME PROCESS

provides a *precisely controlled "package" process* — 10 easy-to-follow, easy-to-use steps

Specify

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FOR CHROMIUM PLATED FINISHES WITHOUT THE USE OF NICKEL

Write for free data sheets and send a part for free processing

*Patent Applied for

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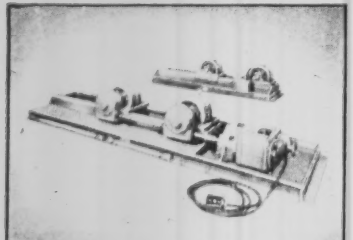
REED
ENGINEERING CO.

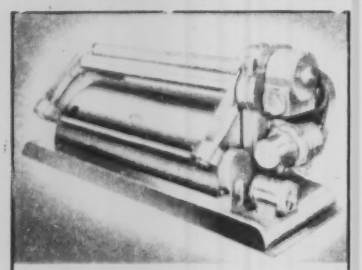
Modern
Metalworking
Equipment

BENDING ROLLS
TURNING ROLLS
AUTOMATIC WELDING
FIXTURES



REED PORTABLE TURNING ROLLS

- In 5 models, capacities up to 75 tons
- For hand or automatic welding, finishing operations on tanks up to 14 ft. diam.
- Reversible, variable speed adjustment
- Rugged, all steel construction
- Built-in silent worm gear drive



REED PLATE BENDING ROLLS

- In 18 models, ranging from 3 ft. x 10 ga. to 8 ft. x ¼" in capacity
- Rugged, all steel construction
- Built-in, silent worm gear drive
- Durable, special bronze bearings
- Power adjustment & air drop end available on most models

WE INVITE YOU . . .
to write us for specifications, prices, list of REED users near you. No obligation. Just write on your letterhead.

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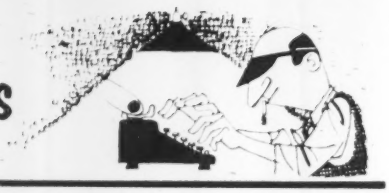
behind the scenes



Perfect Teamwork

Did you see the unusual four page article on the new color metallography process described in STEEL last week (page 93)? We're quite proud of it both from the standpoint of the valuable data it provided the reader and for the fact that it represents the acme in editorial co-operation and co-ordination.

The story was developed by Irwin Such, editor, and Allen Gray, technical editor, who worked with top management officials and technical specialists at Firth Sterling and Eastman Kodak.

After the article was outlined and written, Bill Kellogg's art department went to work on the layout. The text material was set in type by Penton's press department and shipped to the John P. Smith Printing Co. in Rochester, N. Y. The photographs were taken by Eastman and the four-color process printing plates were made under the direction of their color photography experts. The plates were then sent to the John P. Smith Co. for printing. This was carefully supervised by Eastman so as to assure perfect color register.

Upon completion of the printing, the articles were folded and shipped back to Penton for binding into the issue.

Firth Sterling and Eastman Kodak were both so pleased with the end result that Firth Sterling has ordered 15,000 reprints and Eastman 30,000 reprints for general distribution.

Copies may also be secured by writing Readers' Service Department, STEEL Magazine, Penton Bldg., Cleveland 13, O.

Depreciation Reform

Ran into John Morgan, assistant managing editor, on the Rapid Transit (interurban to non-Clevelanders) the other night. We and John were loaded down with brief cases and two-suiters. We were on our way homeward from the Direct Mail Advertisers Association meeting in Detroit; John was returning from a busy two-day, nine-interview trip to Washington.

In our usual subtle manner we asked, "What were you doing in Washington?"

In his usual direct manner he answered that the weather had been delightfully summerish. Five minutes of screeching tracks and jarring stops and starts finally shook loose the answer.

You'll get it first hand in next week's issue of STEEL under the title "Coming Up: Depreciation Reform." This is No. 9 in the popular Program for Management Series and should be one of the most interesting. John's done a real rock-bottom reporting job on this one. Be sure to look for it.

In Transit

Production ahoy allies! That was the theme as the Seaboard Coil Spring Corp. of Bakersfield, Calif., moved into its new $750,000 plant last week.

To demonstrate that it could keep up delivery on current orders, even in transit, a torsion machine was mounted on a truck trailer. Mrs. Pearl Schatzer, an expert machine operator of 11 years' experience with Seaboard, continued to turn out fabricated parts for Standard Coil, one of the nation's largest producers of television tuners, while en route to the new plant.

We wonder if, with a few slight modifications, there might not be an adaptation of this idea so that metalworking companies could pick up their employees at their homes each day in mobile production units. Thus, time in transit to and from the plant could be production time and count as part of the eight-hour day.

Most workers would then gain an average of from one and one-half to two hours leisure time each day which they could spend watching television or beating their children, whichever is more fun.

Sounds like progress—or does it?

Shrdlu

(Metalworking Outlook Page 63)

Wellman will build it

Special Cranes
Gas Producer Plants
Charging Machines
Forging Manipulators
Car Dumpers
Gas Flue Systems
Gas Reversing Valves
Coke Pushers
Mine Hoists
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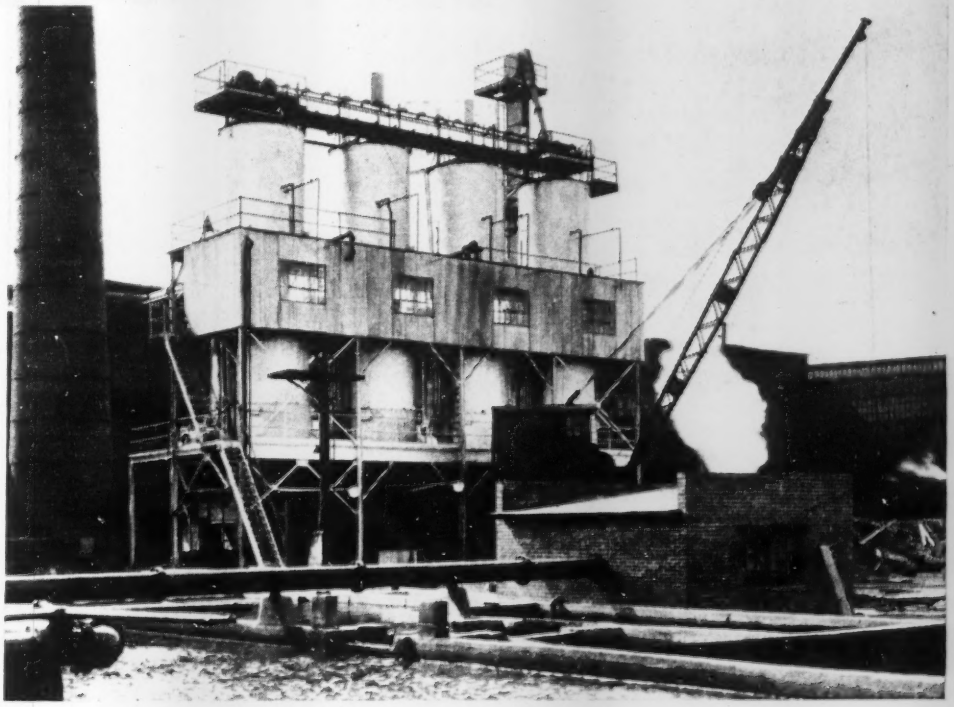
Clamshell Buckets

Wellman-Galusha Clean Gas Generators

Built exclusively by Wellman... for efficient, economical results



Four Wellman-Galusha Clean Gas Generators supplying fuel for steel mill furnaces.

● Only Wellman builds the Galusha Clean Gas Generators that so ideally meet your requirements with efficiency and economy. These generators combine, in a *complete* machine, the rotary grates, ample fuel storage bin, and provisions for generating the steam required for making the gas. Even the lowest-priced grades of Anthracite and coke can be satisfactorily gasified. You can depend on *all* Wellman equipment!

THE WELLMAN ENGINEERING COMPANY

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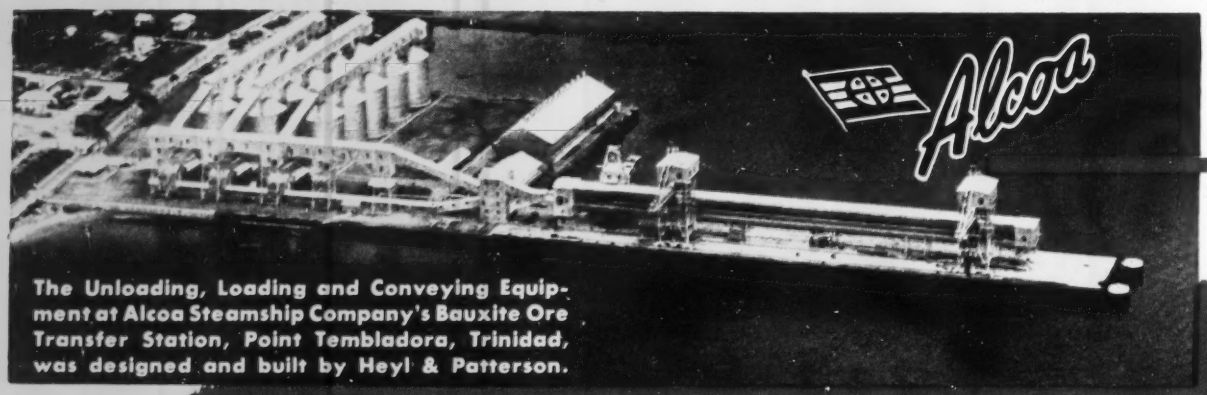
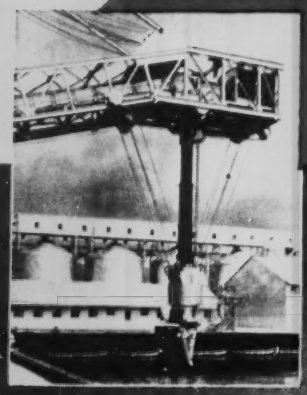


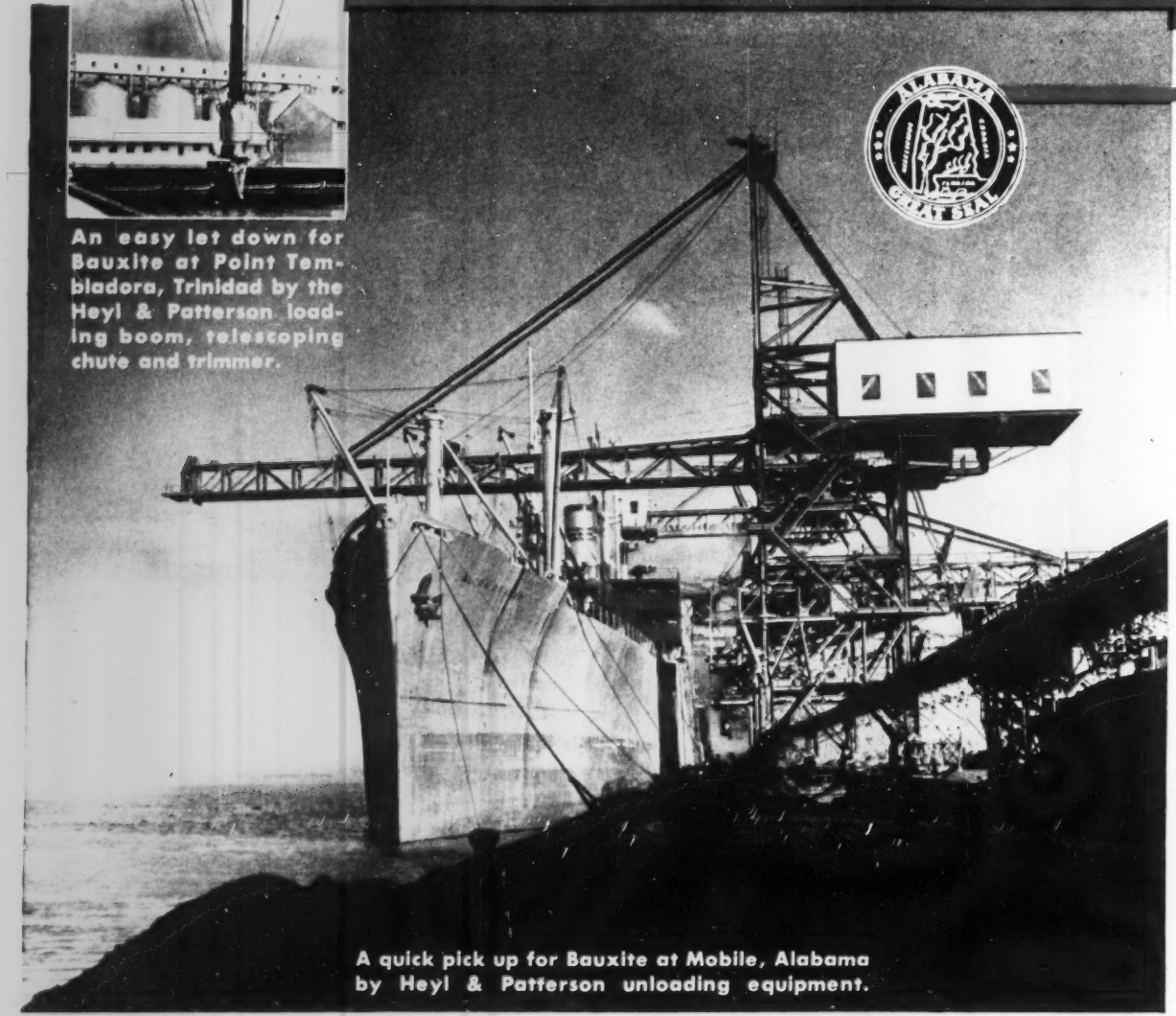
The Unloading, Loading and Conveying Equipment at Alcoa Steamship Company's Bauxite Ore Transfer Station, Point Tembladora, Trinidad, was designed and built by Heyl & Patterson.

HEYL & PATTERSON

Loading and Unloading Equipment



An easy let down for Bauxite at Point Tembladora, Trinidad by the Heyl & Patterson loading boom, telescoping chute and trimmer.



A quick pick up for Bauxite at Mobile, Alabama by Heyl & Patterson unloading equipment.

IN TRINIDAD . . . At Point Tembladora, Trinidad stands the huge Bauxite Ore Transfer Station of the Alcoa Steamship Company. Here bauxite ore is unloaded from river ships by two Heyl & Patterson Unloaders, and carried by Heyl & Patterson conveying equipment either to the storage bins or directly to the Heyl & Patterson loading facilities where the ore is deposited into the holds of ocean-going vessels.

The H & P telescoping loading chute is especially designed to lower the bauxite ore gently and quickly into the hold of the vessel at the rate of 2000 tons per hour with a minimum amount of dust.

Handles Bauxite Quickly and Easily at both ends of its Caribbean Voyage

IN ALABAMA . . . At the Alabama State Docks, Mobile, Alabama . . . the Ship, loaded with Bauxite Ore from Trinidad, docks alongside of the new Heyl & Patterson Traveling Unloading Tower. The bauxite is rapidly unloaded from the ship and deposited onto a belt conveyor for its first step to the processing plant.

This modern 800-tons-per-hour Unloader . . . designed, fabricated and erected for the State of Alabama . . . currently unloads iron ore and manganese ore as well as bauxite.

The special features of this unloading tower illustrate how it was designed to fit operating conditions at Mobile and why it is one of the finest unloaders in operation today.

(1) The Tower is equipped with an extra-long cantilever which enables material to be transferred from the ship either to the conveyor system or directly to a river barge. In the latter operation the barge is positioned at the opposite side of the ship from the Tower and the trolley moves from above the ship to the extreme end of the cantilever to load the barge.

(2) Because of the short rail spacing between the trucks, the machinery house is placed far to the rear of the tower to counter-balance the weight of the extra-long cantilever.

(3) Adjustable voltage electrical control is used to provide smooth starting and stopping and the fastest possible operation. The use of adjustable voltage lowers maintenance costs and reduces power losses.

(4) The filtered air in the machinery house is kept constantly at a higher pressure than the outside air. This prevents infiltration of dust and prevents overheating of equipment.

(5) The operator's cab is mounted on a heavy ram and moves out over the hold of the vessel when unloading. This enables the operator to have a full view of the hold at all times.

(6) Each bucket of ore can be weighed by means of a force cell application which indicates the bucket weight in the operator's cab.

Heyl & Patterson has never designed or built "catalog" loading or unloading equipment. Every Heyl & Patterson installation is especially engineered to meet the particular needs of the customer.

For *YOUR* loading or unloading problem, investigate the advantages of having your installation designed, fabricated and erected by Heyl & Patterson.

Heavy Bulk Materials Handling Equipment *All The Way from Design to Erection*

Boat Loaders and Unloaders
Ore Bridges
High Lift-Turnover-Rotary
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Coal Handling Equipment
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Cyclone Thickeners
Thorsten Coal Samplers
Car Hauls and Boat Movers
Coal Crushers
Bradford Breakers

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DRY, FRESH AIR
For a Supersonic WIND TUNNEL

● New and improved, this NIAGARA METHOD that effectively dries outdoor air for a wind tunnel used for testing at supersonic speed, can be trusted to give you the best air conditions for your purpose:

- **to dry your materials or products**
- **to prevent condensation or moisture damage**
- **to protect your moisture-sensitive processes**
- **to give you an atmosphere in which your product can be packaged or stored safely.**
- **to give you exactly the right atmospheric conditions for testing materials**
- **to put "fresh air" back into your air conditioning, increasing its capacity and effectiveness**

The Niagara "fresh air" Method removes the excess moisture from outdoor air by contact with an absorbent liquid in a spray chamber. The liquid contact temperature and the absorbent concentration, both controlled thermostatically, determine the amount of moisture in the conditioned air. Heating or cooling the air is a separate function. Therefore, you can easily and inexpensively have a precisely controlled condition without the use of moisture sensitive instruments.

The Niagara Absorbent Spray Method is noted for solving the really difficult problems of air conditioning. Write for complete information.

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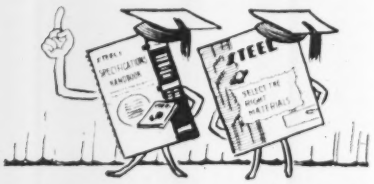
Field Engineers in Principal Cities of U. S. and Canada

LETTERS
TO THE EDITORS

Twosome with the Answers



Have just received our copy of the Oct. 12 issue of STEEL and want to congratulate you on your article "Select the Right Materials for the Job," No. 8 of the Program for Management series (p. 129). This information together with your very complete "Specifications Handbook" is very useful to me and serves to answer just about every question the many engineers pose for me.

If possible, I would appreciate receiving a copy of each of the eight management series articles to date, thereby enabling me to circulate the information to the various departments in our company where it will be most useful.

A. M. Burlison
Liquid Carbonic Corp.
Chicago

Management Buys the Series

I have just finished reading your article "Buy Your Way To Lower Costs," No. 4 in a Program for Management (May 25, p. 105).

I find it both interesting and very stimulating. My only regret is that I was not able to obtain previous articles in this series. I am writing in the hope that I can receive reprints of Nos. 1, 2, 3 and 4.

C. E. Smith
Supervisor, production control
Guided Missiles Department
General Electric Co.
Schenectady, N. Y.

● *Sent. We are also enclosing reprints of the more recent articles in the Program for Management series.—ED.*

What's in an Index?

I've had the misfortune of having my subscription to STEEL start with the Aug. 24 issue. I understand that an article appeared in the Aug. 17 issue describing steel products, extras and deductions applicable to them. I believe the article was entitled "What Goes into the BLS Index" (p. 180).

Will you kindly forward the complete description to me, together with any clippings from previous issues that explain STEEL's weighted finished steel price index and price composites.

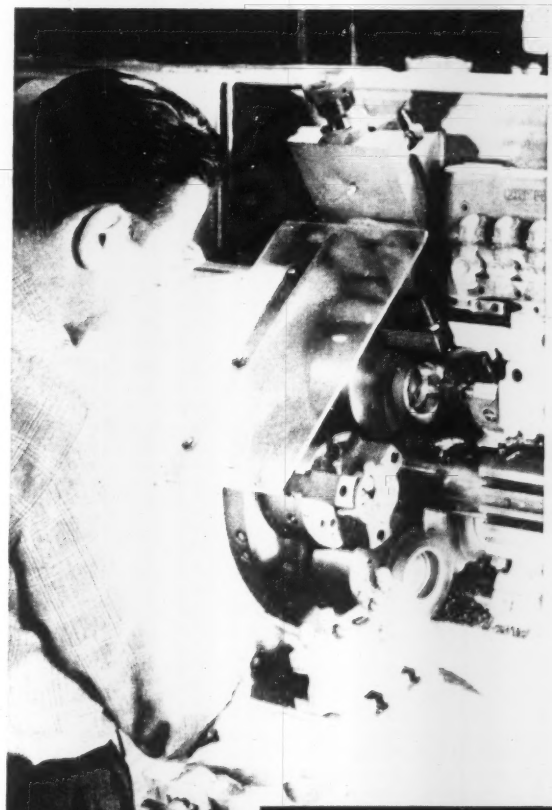
John Barreca, Secretary
Barreca Products Co. Inc.
Jersey City, N. J.

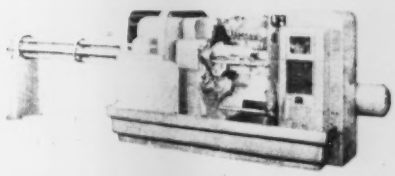
● *With the Aug. 17, 1953 issue we began showing the revised price index and revised list of steel products on which average prices are quoted by the Bureau*

Please turn to page 12

NO CAM WORRIES

with Warner & Swasey Multi-Spindle Automatics





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and now, newly introduced
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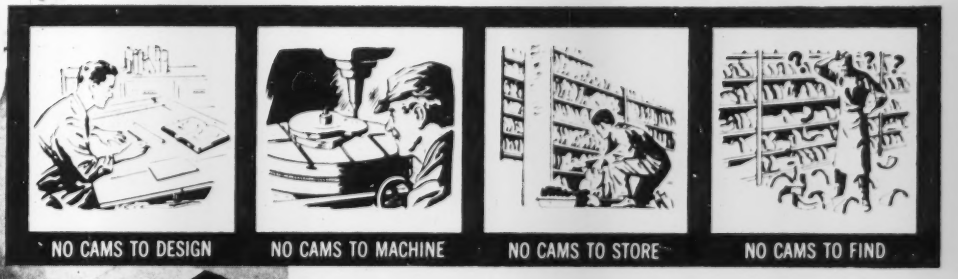

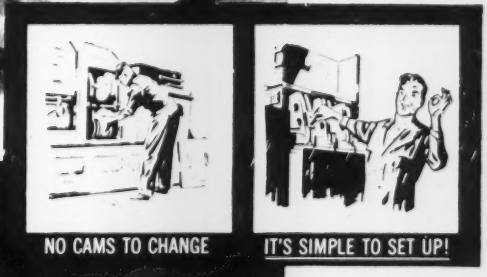

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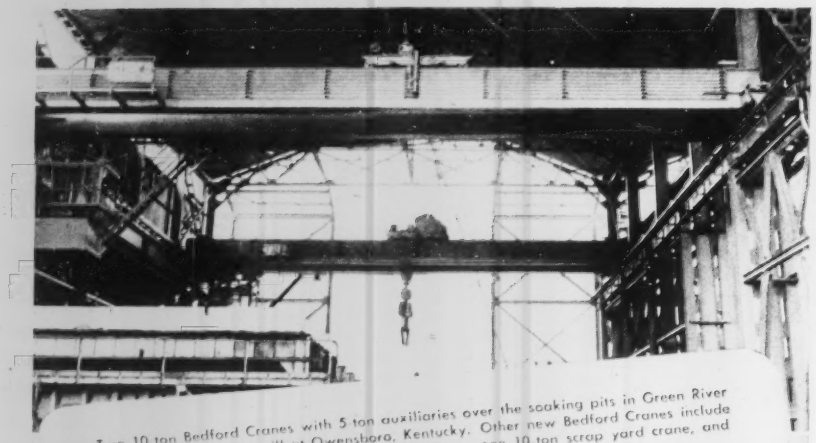

Two 10 ton Bedford Cranes with 5 ton auxiliaries over the soaking pits in Green River Steel Company's new mill at Owensboro, Kentucky. Other new Bedford Cranes include one 75 ton ladle crane, one 25 ton charging crane, one 10 ton scrap yard crane, and two 10 ton utility cranes.

Seven New Bedfords at Green River Steel

More and more steel men are comparing—and choosing Bedford Cranes for advanced design—for precision engineering—for safe, smooth, dependable performance.

Backed by more than 50 years of specialized crane building experience—each Bedford Crane is custom engineered for its specific application.

Available in all types and sizes from 5 tons to 550 tons—and up!

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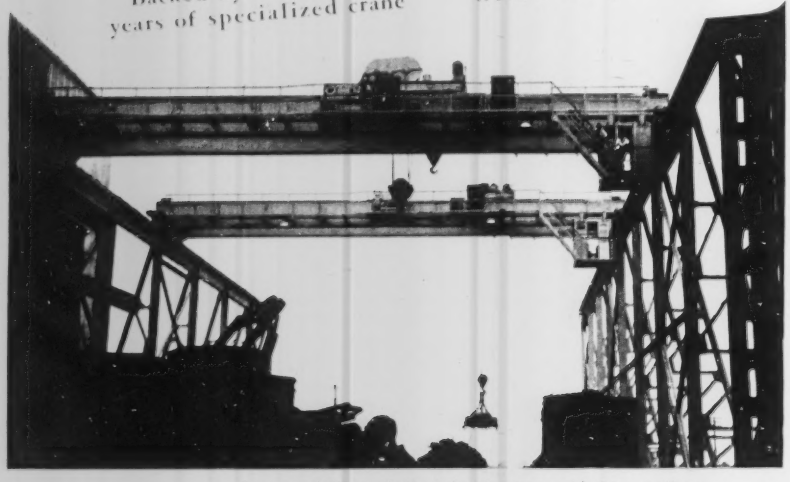

Foreground: 25 ton Bedford charging crane with 5 ton auxiliary.
Background: 10 ton Bedford scrap yard crane.

BEDFORD CRANES SERVICE

STEEL MILL CRANES

BEDFORD

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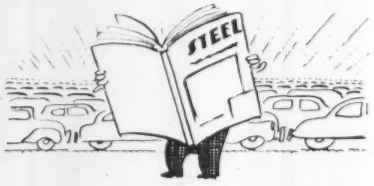
LETTERS

Concluded from page 10

of Labor Statistics. The latest index and price averages appear in each issue. Sent is a list of the products on which the BLS index is based and on which average prices are reported. Also sent is a clipping from our Sept. 1, 1952, issue that gives some explanation of STEEL*'s finished steel price index and arithmetical price composites.—ED.*

Guide to Traffic Control



We have just read the interesting article "Traffic Control: Key to Economical Movement of Goods" (Aug. 31, p. 40), telling the story of James B. Griffin and his traffic department with the Scovill Mfg. Co., Waterbury, Conn.

In the article there was mentioned a "Griffin Plan for Channelizing l.c.l. Freight Shipments." We would like to inquire as to where we may obtain a copy of this plan.

J. D. Fisher
J. L. Clark Mfg. Co.
Rockford, Ill.

• *The "Griffin Plan" for channelizing l.c.l. freight shipments mentioned in the traffic control article is not a book. The plan originated by Mr. Griffin is a briefed-down guide of two parts—one used by rail carriers, and another by shippers. It consists of pamphlets with appendixes such as a channelized routing guide and open instructions to both shippers and carriers that permit flexibility of operations. This guide would be of little assistance to a shipper or carrier not located in New England because present instructions and memoranda are designed for each of the seven localities using the plan in New England. For general information about pooling l.c.l. freight shipments, you might contact one of these organizations: Associated Traffic Clubs of America; National Industrial Traffic League; and American Society of Traffic and Transportation.—ED.*

Jigs for Trailers

We have a copy of STEEL for Oct. 5. On the front cover is a photograph of three welders welding on the frame of a semitrailer. This trailer frame is being held on each end by jigs.

We are wondering if you could tell us the name of manufacturer of these jigs or in whose plant this photograph was taken.

Cliff Barrett
assistant manager
American Body & Trailer Inc.
Oklahoma City, Okla.

• *We do not know who manufactured the jigs shown on the cover of the Oct. 5 issue but the picture was taken in the Avon Lake, O., plant of the Fruehauf Trailer Co.—ED.*

Gardner Abrasive Engineering

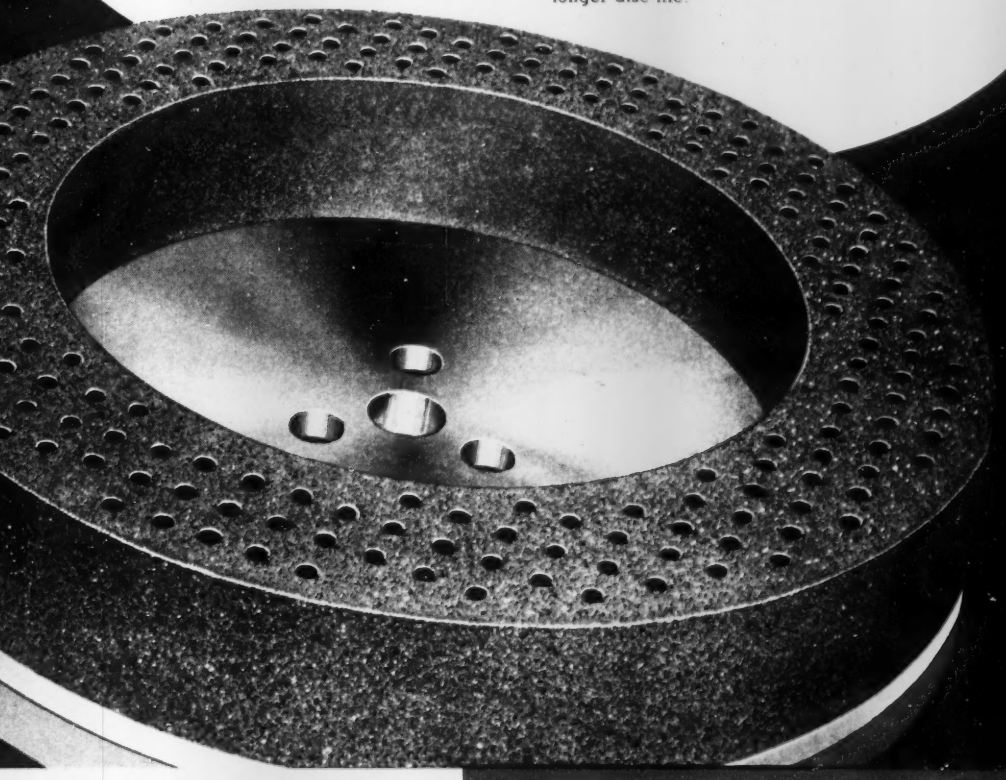
How an abrasive disc was tailored to a special work carrying fixture

THE PROBLEM

A double disc grinder with a rotary work carrying fixture was producing periodic inaccuracies in work. The abrasive disc continually built up a ridge around the center hole. Frequent dressing was necessary to hold tolerance. Production was low, abrasive life short.

THE SOLUTION

Gardner Engineers located trouble in location of rotary work carrying fixture. Work pieces were not reaching center hole of disc, thus causing a ridge to form around center area. Problem was solved by furnishing discs with larger centers, permitting a portion of each work piece to pass into the center. Immediate results were fewer rejects, more production, longer disc life.



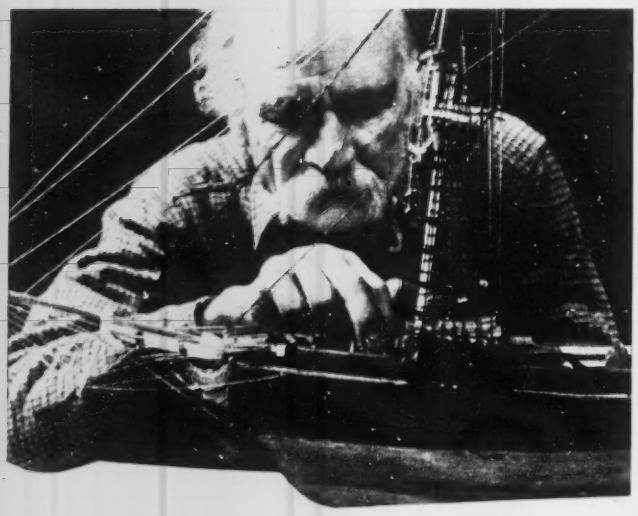
Gardner Abrasive Engineering offers experience derived from making both the grinding machines and the abrasive discs. It considers machine performance first and then evaluates how grade and grain of abrasive or type of disc affect grinding results. If standard abrasive discs won't do the job, discs are made *just for you.*

For help with *your* grinding problem, consult the Gardner Abrasive Engineer. 114A

GARDNER MACHINE COMPANY
420 Gardner St., Beloit, Wisconsin, U. S. A.

GARDNER
abrasive discs

Craftsmanship is the answer



EAGLE Music Spring Wire

Round Untempered Low and High Carbon Spring Wires

Flat Cold Rolled Strip 6" and Narrower, Bright, Galvanized, Tinned and Cadmium Finish

Flat Tempered and Untempered Wires in .30 to 1.25 Carbon Range

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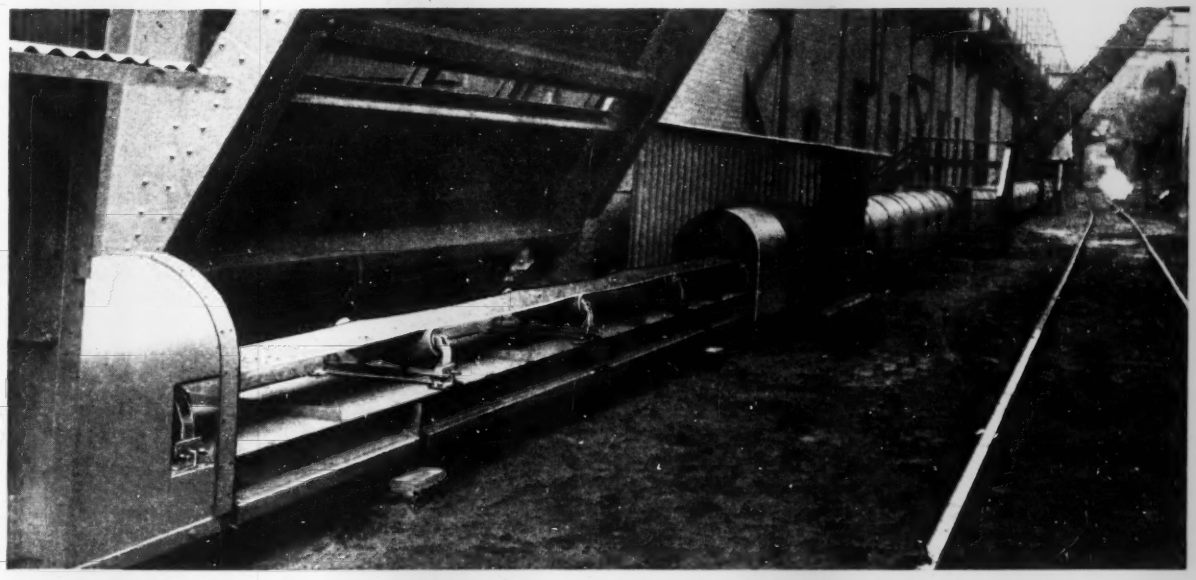
WASHBURN WIRE COMPANY, NEW YORK CITY

WASHBURN

CLEAN, UNIFORM BILLETS — STRIP — RECTANGULAR, ROUND, FLAT RODS — TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES



This Link-Belt belt conveyor (with part of cover removed) easily handles coke breeze for blast furnaces at steel mill.

TOTAL ENGINEERING

It's LINK-BELT's answer for improved belt conveyor performance

BELT conveyor efficiency begins with correct analysis of overall system requirements. And right from the start Link-Belt offers you unique advantages. Our engineers can apply broad experience to your bulk handling problems.

Working with a complete line of quality components, they can select the belt conveyor equipment best suited to your exact needs. What's more, Link-Belt has a nation-wide engineering organization that will follow through on every detail. This includes supplying all related equipment . . . building supporting structures and enclosures . . . erecting the complete job, if desired.

It's easy to see why "total engineering" results in top belt conveyor performance. For complete information, call the Link-Belt office near you today.

13.130-E

LINK-BELT

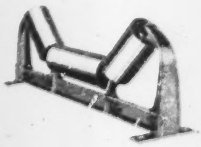
BELT CONVEYOR EQUIPMENT

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities.

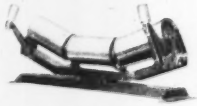
LINK-BELT builds a complete line of belt conveyor components

ALL TYPES OF ROLLER BEARING IDLERS

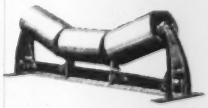
Impact-cushioning idler



45° troughed idler



Belt-training idler

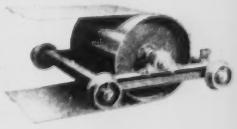


20° troughed idler

Return idler

BELT AND MOTOR PROPELLED TRIPPERS

COMPLETE TERMINAL MACHINERY



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PICKLING ACID INHIBITORS

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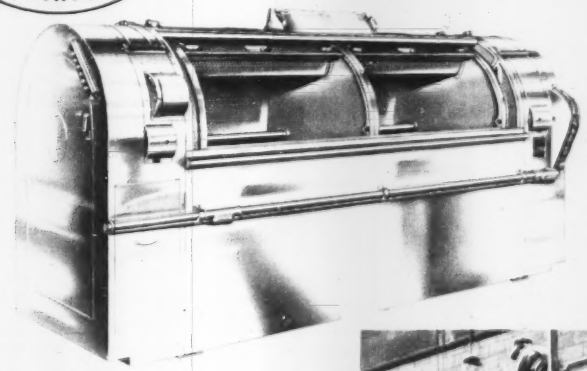
NBP

New facts for your file on U·S·S STAINLESS STEEL

MANUFACTURED FROM USS STAINLESS STEEL UNITED STATES STEEL

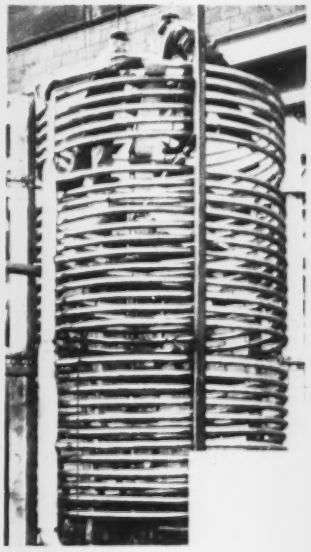
Corrosion-resisting Stainless Steel now used in American Laundry Machinery Co. Cascade Washers



Stainless Steel, with its superior corrosion resistance and smooth, durable, easy-to-clean surface, is now being used for many of the parts in American Laundry Machinery Company's Cascade Washers.

The tub, the cylinder, drive guards, supply trough and instrument panel are all Stainless Steel. Most of these parts come in direct contact with the hot, soapy water, and Stainless Steel will provide long, satisfactory service life under such conditions.

Stainless Steel tubing selected for coil assembly of penicillin fermenter



In fabricating a custom-built, 15,000-gallon fermenter tank for one of the nation's leading penicillin manufacturers, The Pfaudler Company, Rochester, N. Y., used 3" O. D. Stainless Steel tubing for the coil assembly.

Stainless Steel's corrosion resistance, as well as its excellent sanitary properties, led to its selection for this important application.

Take advantage of Stainless Steel in your designs and in your selling

These applications are typical of the way Stainless Steel can be used to improve design and add sales appeal in a wide variety of products. Stainless' wide range of valuable properties make it the ideal material for many, many jobs.

Put Stainless to work for you. It will pay its own way and give you a good return on your investment — especially when it is perfected, service-tested U S S Stainless Steel.

Thermador cooking units take advantage of Stainless Steel's beauty and durability

The beauty, the ease of cleaning and the long-lasting qualities of Stainless Steel are used to full advantage in the line of separate cooking units manufactured by Thermador Electrical Manufacturing Company, Los Angeles, California.

Thermador makes good use of the sales appeal of the unique properties of Stainless Steel and finds its fabricating qualities make it ideally suited for applications like this.

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS

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UNITED STATES STEEL

"We've got this

says Joseph Asmonga,

UNITED STATES STEEL

heat treating down cold"

U. S. Steel Heat Treater

In the entire production of steel forgings, no single operation is more important or more finicky than the heat treating. Here, with careful heating and quenching, the forging is tailor-made to the physical properties you require.

At best, heat treating is a complicated business. And when you get into the giant forgings made at our Homestead Forgings Division, you encounter problems absolutely unknown in the production of smaller forgings. Only a handful of men in this country have the skill to do the job. One of them is Joseph Asmonga, a Heat Treater for 18 of the 25 years he has been with U. S. Steel.

Sheer *size* is a great problem and often makes liquid oil or water quenching impracticable. In the photograph, Mr. Asmonga is *air* quenching a roll arbor—and it takes him 10 hours just to reduce the temperature from about 1750°F. to 650°F.

Admittedly, Mr. Asmonga has an eye-popping array of instruments, furnaces and cranes to help him—as well as a complete metallurgical staff. But when you get right down to it, it takes plain old experience and skill to change a list of specifications into a finished, precisely heat treated forging.

Joseph Asmonga is typical of the men who actually do the work on your U S S Quality Forgings. All of these men have the skill, the equipment and the *determination* to give you the finest steel forgings that money can buy. Write for more information and our free 32-page booklet describing U S S Quality Forgings. Address United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS

Quality FORGINGS

- heavy machinery parts—carbon, alloy, stainless
- electrical and water wheel shafts
- hammer bases and columns
- forged steel rolls and back-up roll sleeves

New facts for your file on U·S·S

Made of U·S·S MAN-TEN steel, vital parts of land leveler and ditching plow weigh less but wear longer

Switch to U·S·S MAN-TEN steel solves serious forming problem, increases rigidity, saves weight

Lyon Metal Products, Inc., Aurora, Illinois, originally specified 20-gage carbon steel for the seats of these steel folding chairs. In press forming, the seat section showed a tendency to crease across the bracing angle. Although the crease was scarcely noticeable to the touch, it became very obvious under certain light reflections and created sales resistance.

To overcome this, Lyon switched to cold-rolled U·S·S MAN-TEN steel in 22-gage weight. This strong, tough steel gave greater rigidity to the seats and completely eliminated the creasing or buckling. Although weight saving was not a factor in the selection of U·S·S MAN-TEN, the change resulted in a weight reduction per seat blank of three-quarters of a pound, which appreciably cuts the steel tonnage required, keeps manufacturing costs down, lowers shipping costs.

The Eversman Manufacturing Company, Denver, Colo., have used U·S·S MAN-TEN and other U·S·S High Strength Steels in their famous line of agricultural implements for a good many years. Recently they wrote:

"We had been using ¼" mild carbon steel for the curved center-cutting blade of our Model 289 Land Leveler and wanted to reduce its weight. We were able to do this by changing to 10-gage hot-rolled MAN-TEN steel which weighs 44% less. Then we did some checking with our dealers and find that the MAN-TEN steel blade wears 20% longer.

"The Eversman Ditcher is a new product with us. To keep it as light and strong as possible and give it good resistance to wear, we naturally decided on MAN-TEN steel for the curved wings as they perform a function similar to the cutting blade on the Leveler. The MAN-TEN steel gives us a very strong durable section which can take a great deal of punishment without being bent out of shape as happens with ordinary carbon steel."

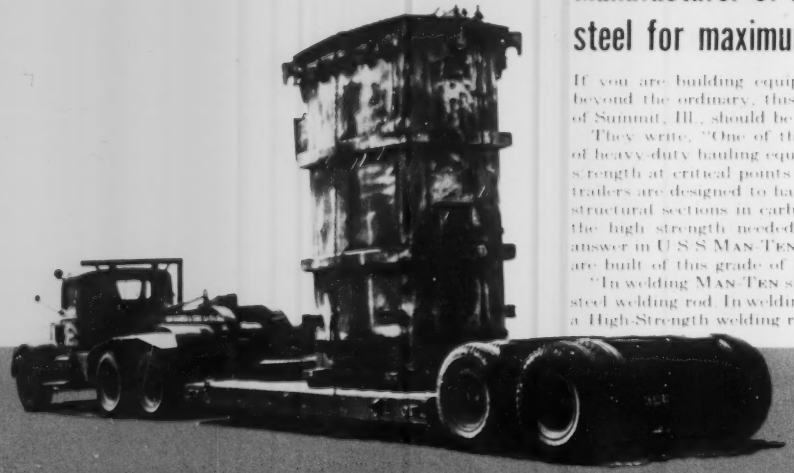
In hard-working farm equipment like this and in heavy-duty earth moving and materials handling equipment such as cranes, power shovels, drag line excavators, scrapers, bulldozers, trenchers, snow plows, etc., wherever parts are subjected to severe wear and punishing loads and stresses, the high resistance to abrasion, high endurance limit and superior yield point values of U·S·S MAN-TEN steel can be utilized at little or no increase in cost to reduce weight, increase capacity and prolong life. It will pay you to examine the possibilities of this service-tested steel.

Manufacturer of heavy-duty trailers uses MAN-TEN steel for maximum strength with minimum weight

If you are building equipment that requires strength, toughness and stamina beyond the ordinary, this letter from the Talbert Construction Equipment Co. of Summit, Ill., should be of interest.

They write, "One of the principal problems confronting us as manufacturers of heavy-duty hauling equipment is the control of design so as to insure adequate strength at critical points with minimum weight. The extremely heavy loads our trailers are designed to handle—up to 100 tons—called for the use of very heavy structural sections in carbon steel or the adoption of a steel that would give us the high strength needed without increasing the dead weight. We found the answer in U·S·S MAN-TEN steel, and our main beams, center sill and side channels are built of this grade of high strength steel, with excellent results.

"In welding MAN-TEN steel to mild steel, good results are obtained using a mild steel welding rod. In welding MAN-TEN to MAN-TEN, best results are secured using a High-Strength welding rod."



U·S·S HIGH STRENGTH STEELS

U·S·S COR-TEN · U·S·S MAN-TEN · U·S·S TRI-TEN

HIGH STRENGTH STEELS

1933 USS HIGH STRENGTH STEELS UNITED STATES STEEL 1953
TWENTY YEARS OF PERFORMANCE

Roof purlins of U·S·S MAN-TEN steel weigh no more than carbon steel, carry 72% more live load, cost 22% less to use

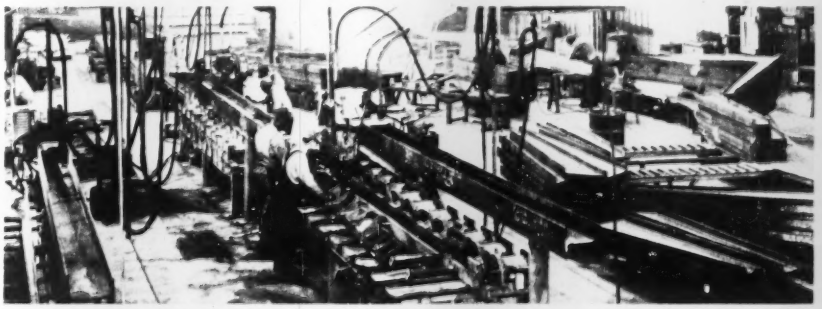
● Butler Manufacturing Co., Kansas City, Mo., a leading producer of pre-engineered buildings, illustrates perfectly how U·S·S MAN-TEN steel often provides more effective strength per dollar, and is therefore more economical than any other material.

Says Mr. W. B. Larkin: "At present we are making generous use of U·S·S MAN-TEN steel for roof purlins and side wall girts on our standard rigid frame buildings. By a rolling and press brake operation, MAN-TEN steel strips are formed into Z sections approximately 6½" high with flange 2½" wide.

"Originally we made these members of 14-gage carbon steel which, when properly spaced, carried a roof load of 15 lbs. per sq. ft. The expansion in our business required that we furnish a building for heavier roof loads. We were limited by our fabrication equipment which is very expensive, so it was decided to use high tensile material of the same thickness to carry this heavier roof load. The use of U·S·S MAN-TEN steel in the same gage gave us the necessary increase in load-bearing capacity, as follows: 14-gage carbon steel purlins, weighing 62 lbs., supported a load of 15 lbs. per sq. ft.

"In contrast, 14-gage U·S·S MAN-TEN steel purlins, in the same weight, supported a load of 26 lbs. per sq. ft. Result: 72% increase in load bearing capacity with a 22% decrease in cost ratio per pound of live load capacity.

"You can see from this that even though the base price of U·S·S MAN-TEN is higher than carbon steel, when compared with the job it does . . . is less expensive than regular steel. We are now considering the use of MAN-TEN steel for the fabrication of complete rigid frames for larger buildings."



MECHANICAL PROPERTIES OF U·S·S MAN-TEN STEEL		THICKNESSES	
	½ Inch and Under	Over ½ to 1½ Inch Incl.	Over 1½ to 3 Inches Incl.
Yield Point, min., psi	50,000	45,000	40,000
Tensile Strength, min., psi	75,000	70,000	65,000
Elong. in 2 In., min., per cent	20	———	22
Elong. in 8 In., min., per cent			
180° In. and heavier	18	19	20
Cold Bend	180° D 1t	180° D 2t	180° D 3t

The minimum yield point and tensile strength requirements will be reduced by 5,000 psi when the material is specified in the annealed or normalized conditions. ASTM Standard Specimens, minimum number of tests and ductility modifications apply.

ADDITIONAL TYPICAL PROPERTIES FOR ENGINEERING GUIDANCE

Resistance to atmospheric corrosion	2 times carbon steel
Compressive Yield Point, psi	Equal to tensile Yield Point
Shearing Strength, psi	Equal to ¾ Tensile Strength
Modulus of Elasticity, psi	28,000,000 to 30,000,000
Endurance Limit (as rolled, ave.), psi	39,000
Charpy Impact, keyhole notch (as rolled, room temp. ave.), ft. lb.	30
Coefficient of Expansion per degree F, 70° to 200° F	.0000063

Send for the ***MAN-TEN*** *Book, get complete information*

United States Steel Corporation
525 William Penn Place, Room 2811-U
Pittsburgh 30, Pennsylvania

Please send me a copy of your book "U·S·S MAN-TEN"

Name _____ Title _____

Company _____

Address _____

City _____ State _____

USS

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

New facts for your file on U·S·S CARILLOY STEELS

U·S·S CARILLOY steel cushions bone-rattling jolts on the world's finest medium tank

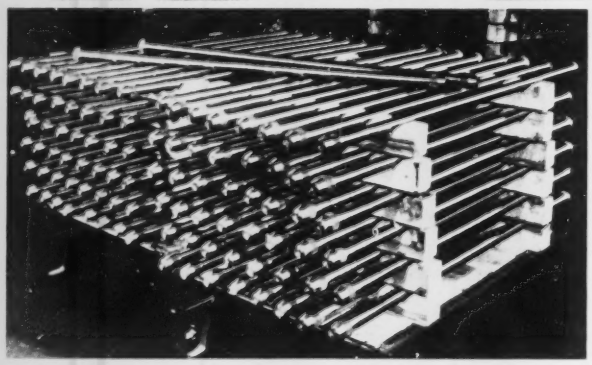
THE army's amazing new Patton 48 not only moves faster, shoots straighter, and offers better protection to the tank crew, but it has a vastly improved suspension system that features torsion bar springs made of U·S·S CARILLOY steel. As a result, it rides lower and more level and with less jarring than World War II models.

During rugged field tests, this 45-50-ton tank rolls along at more than 30 miles an hour, knocks down telephone poles and houses, rumbles over deep trenches and scales 3-foot walls. All the while, the CARILLOY steel torsion bars that support the driving wheels flex, twist, and vibrate. They smoothly absorb most of the jolts as the tank forges ahead.

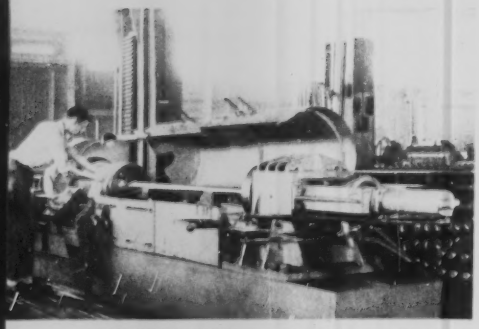
Torsion bars withstand this heavy pounding . . . and do a better job of cushioning these shocks than previous spring systems. What's more they take less space, so the tank can be built closer to the ground, has a lower silhouette than other models.

U S S CARILLOY 8660 is a Ni-Cr-Mo electric furnace steel which possesses the required hardenability needed in these torsion bars. It will produce a minimum hardness of 55 Rockwell "C" at $\frac{1}{16}$", from the quenched end in the standard End Quench hardenability test. It has exceptionally good surface and subsurface qualities.

Both the United States Army Ordnance Corps and the spring manufacturer, Maremont Automotive Products, Inc., are well satisfied with this excellent performance.



HERE are the CARILLOY steel torsion bars ready for shipment. Torsion bars are used on the Patton 48 and others so that the tanks can be built closer to the ground, giving a lower silhouette.



ON THIS TWISTER at the Cicero plant of Maremont Automotive Products, Inc., the finished CARILLOY steel torsion bars are prestressed before shipment to the tank manufacturer.

U S S CARILLOY steels are doing many tough jobs like this on both military and civilian products. So no matter what type of steel problem you have, we have probably met and licked one very much like it before. We can help you solve yours. Just get in touch with our nearest District Office, or write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS

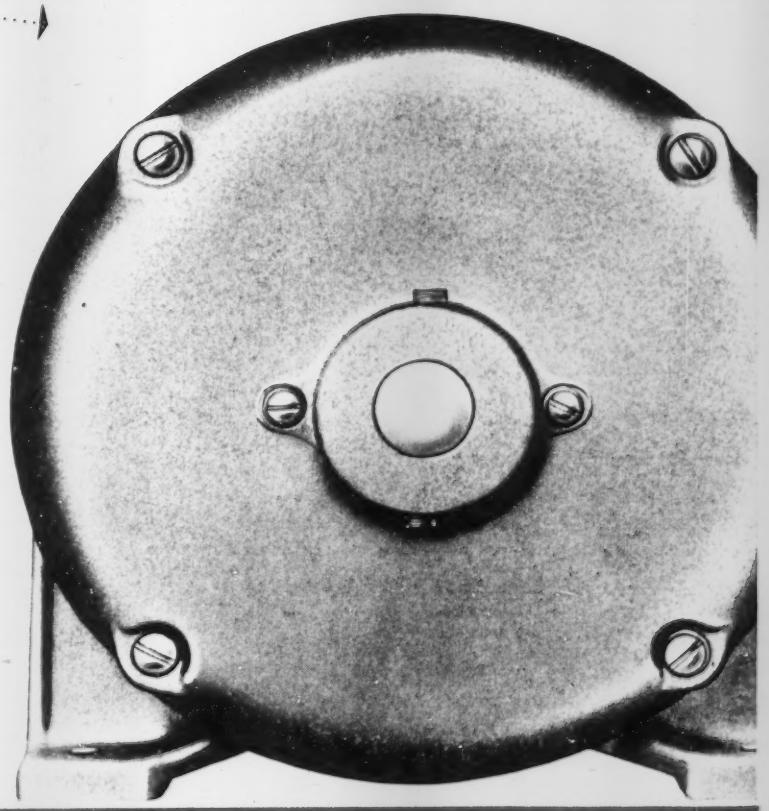
UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

DEPENDABILITY...
that builds dividends
Delco Motors

Delco integral motors are one item of manufacturing cost that does not come under the head of "variable." They are so consistently dependable in operation that they have a stabilizing effect on production costs—and on dividends.

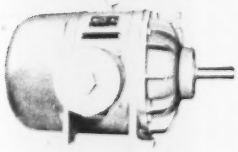
There are Delco motors for most applications—motors that will fit into **your** needs. A sales engineer from any one of the offices listed below will respond to your inquiry.



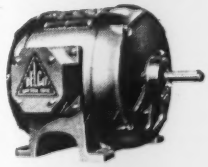
DELCO
DAYTON OHIO

DELCO PRODUCTS

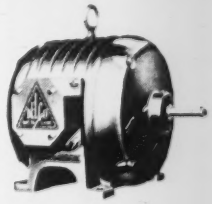
Division of General Motors Corporation
Dayton, Ohio



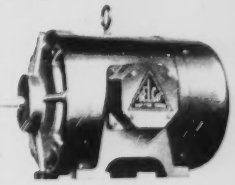
Explosion-Proof Motor



Open Ball-Bearing Motor



Totally Enclosed Motor



Totally Enclosed Fan-Cooled Motor

SALES OFFICES: Atlanta • Chicago • Cincinnati • Cleveland • Dallas • Detroit • Hartford • Philadelphia • St. Louis • San Francisco

want fast convenient service on stainless cold heading wire?

Now you can get immediate delivery of Crucible cold heading stainless steel wire in a full range of sizes from our nation-wide chain of warehouses. Whether you need a pound or a carload, we are prepared to serve you quickly and efficiently.

Crucible's wire mill is equiped with the finest annealing, pickling, and drawing equipment . . . all of which means greater production of better wire. And our mill metallurgists check every operation from billet to finished product to assure you of uniformly high quality from coil to coil.

Call us when you have a stainless wire application. We can help you.

Stocks maintained of:

Rex High Speed Steel . . . A.I.I. grades of Tool Steel (including Die Casting and Plastic Die Steel, Drill Rod, Tool Bits and Hollow Drill Steel) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) Mavcl . . . MSI Alloy, Onyx Spring and Special Purpose Steels

CRUCIBLE first name in special purpose steels

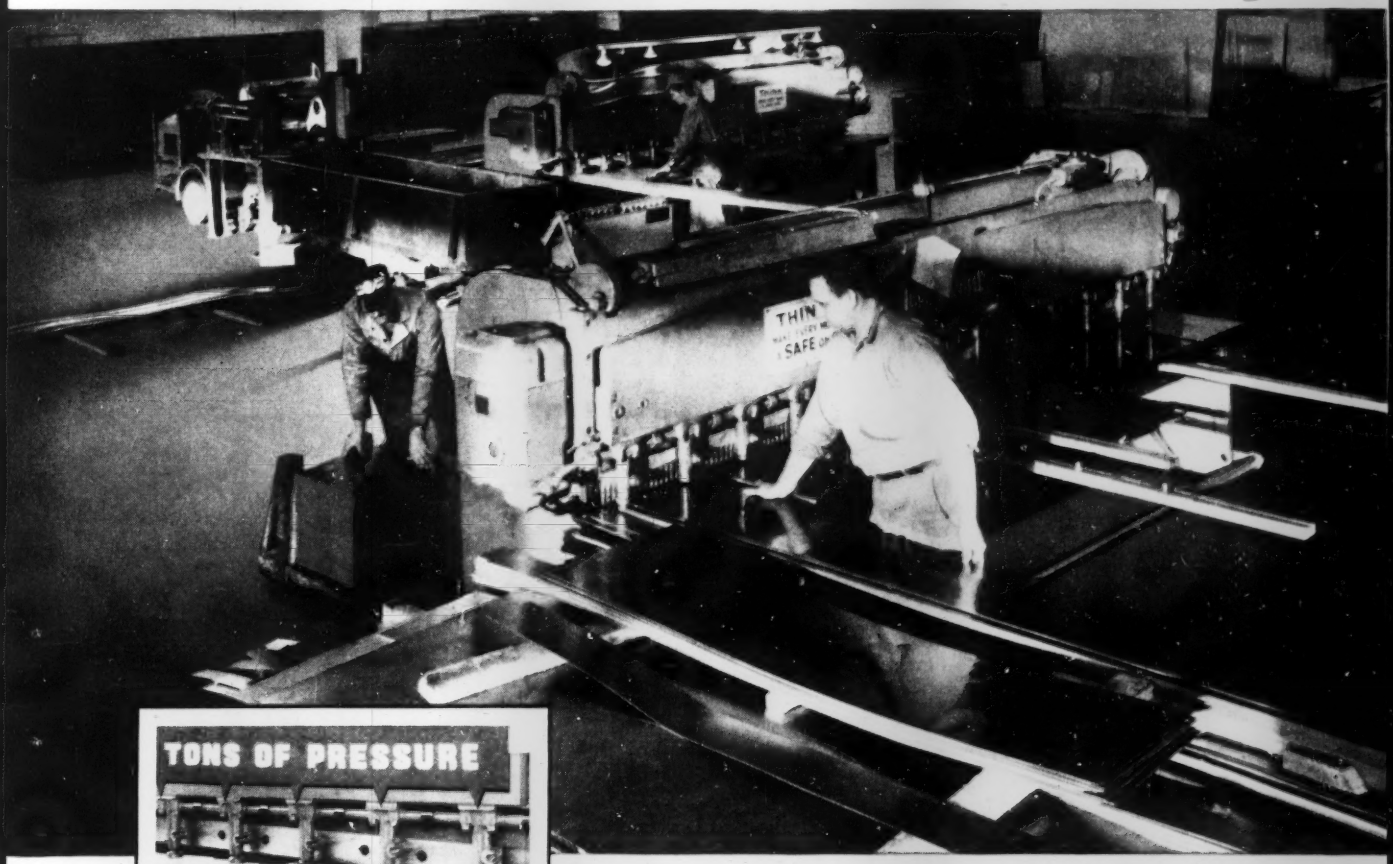
53 years of Fine steelmaking

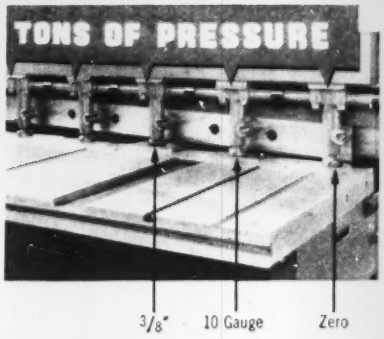
WAREHOUSE SERVICE

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

Branch Offices and Warehouses: ATLANTA • BALTIMORE • BOSTON • BUFFALO • CHARLOTTE • CHICAGO • CINCINNATI • CLEVELAND • DAYTON DENVER • DETROIT • HOUSTON • INDIANAPOLIS • LOS ANGELES • MILWAUKEE • NEWARK • NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH PROVIDENCE • ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • ST. PAUL • SYRACUSE • TORONTO, ONT. • WASHINGTON, D.C.

ACCURACY is necessary





Micrometer accuracy starts with Cincinnati Hydraulic Holddowns. They exert tons of pressure and automatically hold all thicknesses of work securely.

...AND THE SPEED AND VERSATILITY OF CINCINNATI SHEARS IS NEEDED, TOO

Here at The W. J. Holliday Company, Inc., The Department Store of Steel—these busy Cincinnati Shears operating continuously, shear accurate blanks to customer size.

They handle cold finished, or pickled and oiled sheets up to 10 gauge and hot rolled sheets up to ¼". Both management and operators are enthusiastic about their Cincinnati Shears.

Write for Shear Catalog S-6.

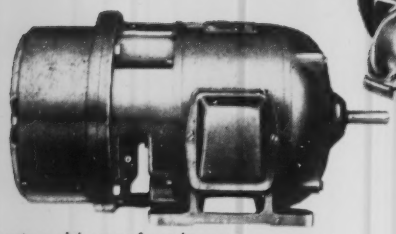
Photos courtesy The W. J. Holliday Company, Inc., Indianapolis, Indiana

THE CINCINNATI SHAPER CO.

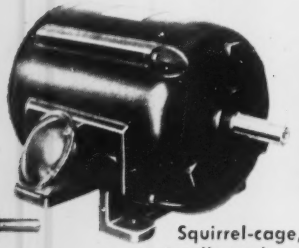
CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

Good equipment deserves..

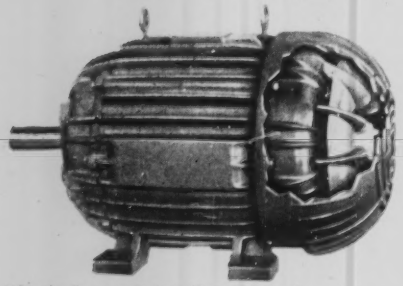


Brakemotor, dripproof enclosure.



Squirrel-cage, totally-enclosed, non-ventilated.

Squirrel-cage splashproof and vertical flange mounting.

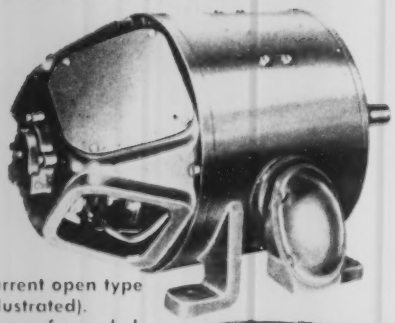


"Sealedpower" totally-enclosed fan-cooled squirrel-cage.

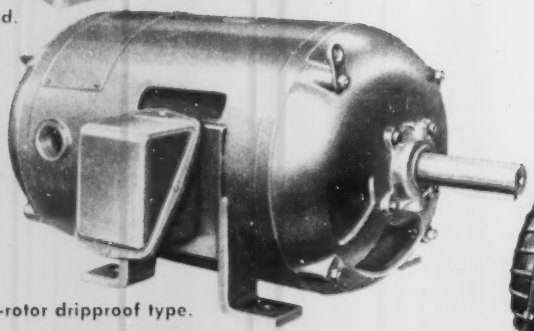
ELLIOTT

CROCKER-WHEELER

MOTORS



Direct-current open type (illustrated). Also dripproof guarded.



Wound-rotor dripproof type.

Explosion-proof "Sealedpower."

Squirrel-cage open dripproof and horizontal C-face mounting.

• You can find the motor you need in this 1 to 200-hp group, anywhere from the small totally-enclosed non-ventilated squirrel-cage motor to the powerful and husky mill motor, and including the new Elliott C-W Gearmotor.

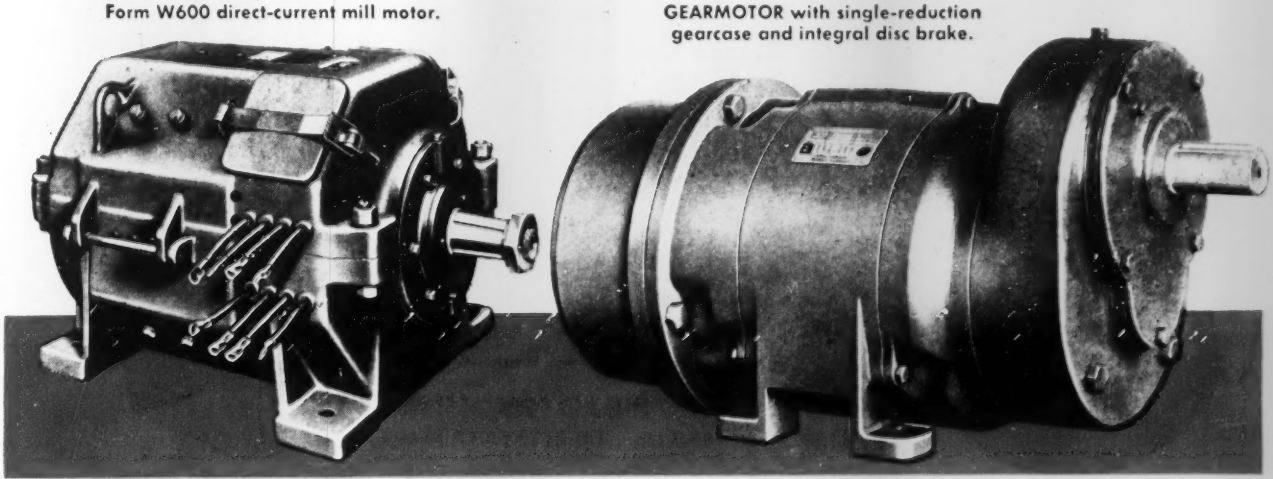
Get the facts—contact your local Elliott representative, or write for the latest bulletin. Address Elliott Company, Crocker-Wheeler Division, Ampere, N. J.

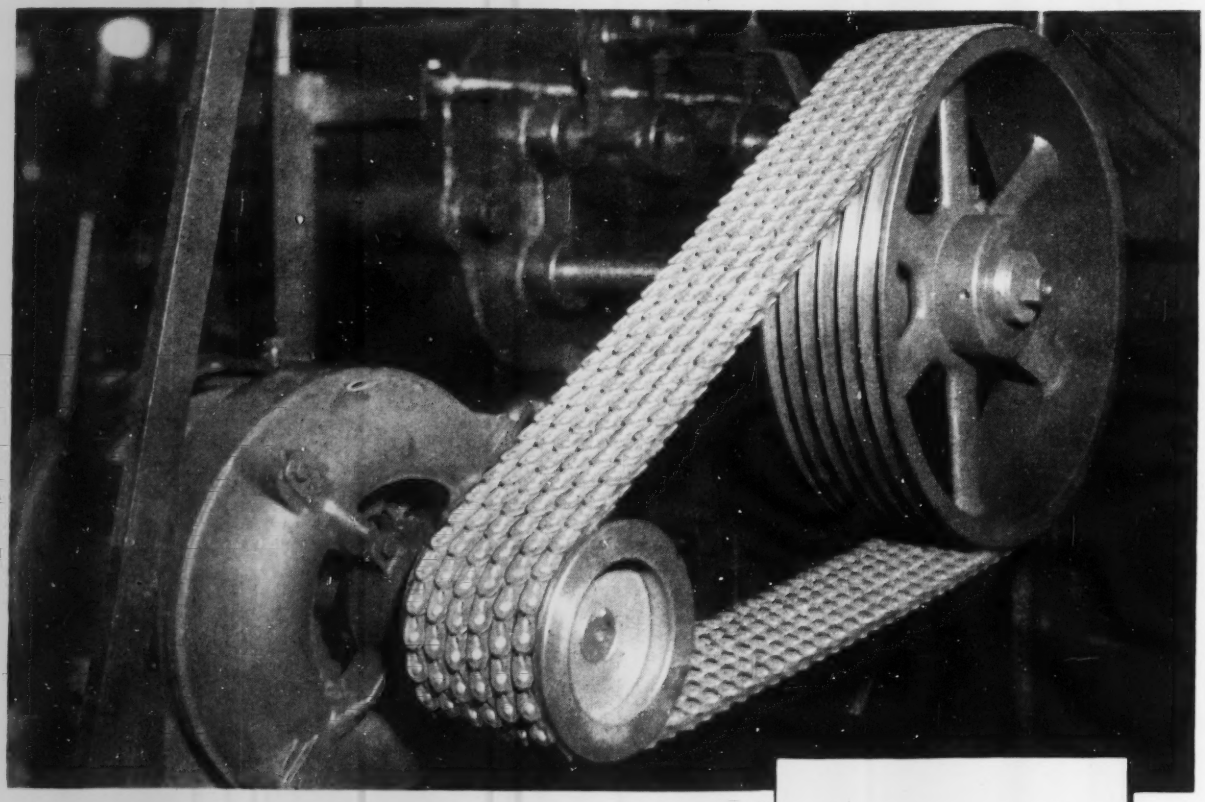
ELLIOTT Company

CROCKER-WHEELER DIVISION

Form W600 direct-current mill motor.

GEARMOTOR with single-reduction gearcase and integral disc brake.





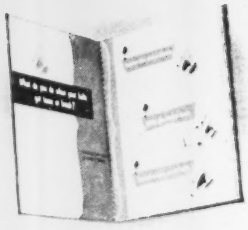
with Veelos on your machines...

v-belt adjustment is a production-saving job

All v-belts stretch—but with endless v-belts there's nothing you can do to take up this stretch once the motor has been completely "run-out". With Veelos it's another story! The adjustment is in the belt itself—even sliding motor bases are unnecessary.

Changing the length of each Veelos v-belt by just adding or removing links is the best, most efficient, way to keep the belts correctly matched. Using Veelos means that the job of adjustment is done easily and quickly . . . at a fraction of the cost of replacing with new belts.

Veelos, the adjustable v-belt, provides vibrationless, full power delivery. It is easier to stock and control because it is packaged on 100-foot reels in every standard width. And Veelos can be adjusted or made up in correctly matched sets with the least amount of machine down-time—at production-saving speed!



Have you seen this Veelos Facts Book?

Your Veelos v-belt distributor's salesman will be glad to give you a quick trip through this fact-packed, 36 page book. You'll find it well worth the few minutes it takes. Next time the salesman calls, ask him to show it to you.

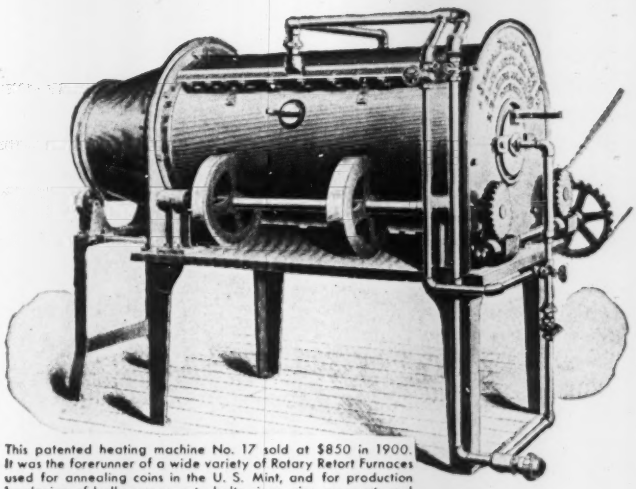
VEELOS
THE LINK
V-BELT

Write today for your copy of the Veelos Data Book—it is a completely illustrated, 28-page catalog that gives file-worthy product and engineering facts which you should have handy. We'll be glad to send you a copy at once.

MANHEIM MANUFACTURING AND BELTING COMPANY
613 Manbel Street, Manheim, Penna.

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

PIONEERS THEN!



This patented heating machine No. 17 sold at $850 in 1900. It was the forerunner of a wide variety of Rotary Retort Furnaces used for annealing coins in the U. S. Mint, and for production hardening of balls, screws, nuts, bolts, rings, pins, gun parts and many other items.

AMERICAN GAS FURNACE CO. 1878 75 years 1953 ELIZABETH NEW JERSEY

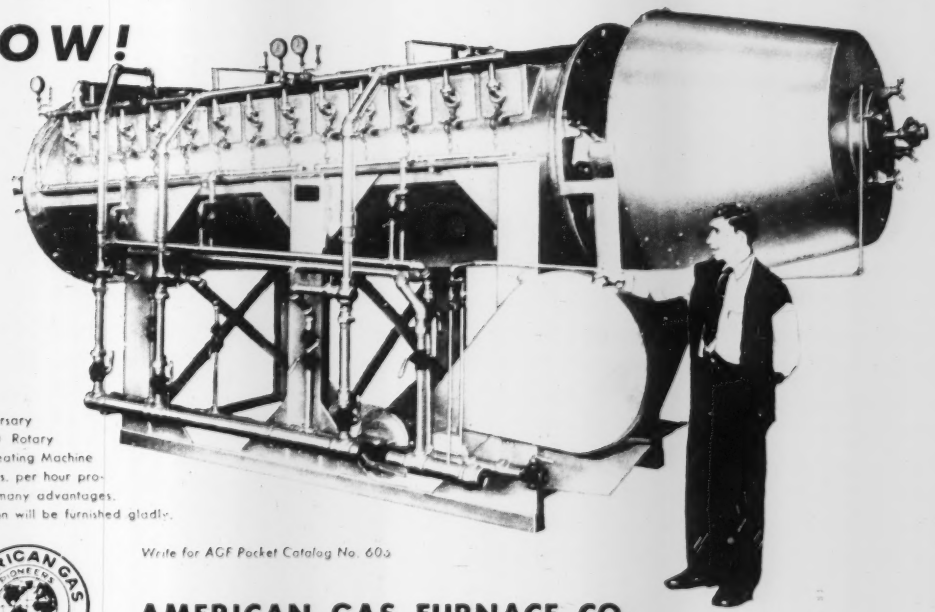
At the turn of the century AGF inventors and metallurgists had been developing and building industrial gas furnaces and equipment for twenty-two years.

On its 75th Anniversary, American Gas Furnace Co. proudly salutes those other PIONEERS of industry who used AGF Furnaces. To you—our customers—goes the credit for Seventy-five years of AGF Industrial Gas Furnace progress.

SOME AGF FIRSTS!

1st Chain Conveyor Heating Machine 1899
1st Roller Hearth Heating Machine 1899
1st Continuous Rotary Retort Furnace 1902
1st Automatic Temperature Control 1910
1st Vertical Retort Gas Carburizers
1st Rotary Carburizing Furnace
Originated Gas Carburizing
Originated use of Ammonia in Heat Treatment (Nitriding and the Nicarb process)

PIONEERS NOW!



The 75th Anniversary Model No. 139MD Rotary Retort Continuous Heating Machine is a 500 to 1000 lbs. per hour production furnace of many advantages. Complete information will be furnished gladly.

Write for AGF Pocket Catalog No. 60a

AMERICAN GAS FURNACE CO. PIONEERS 1878

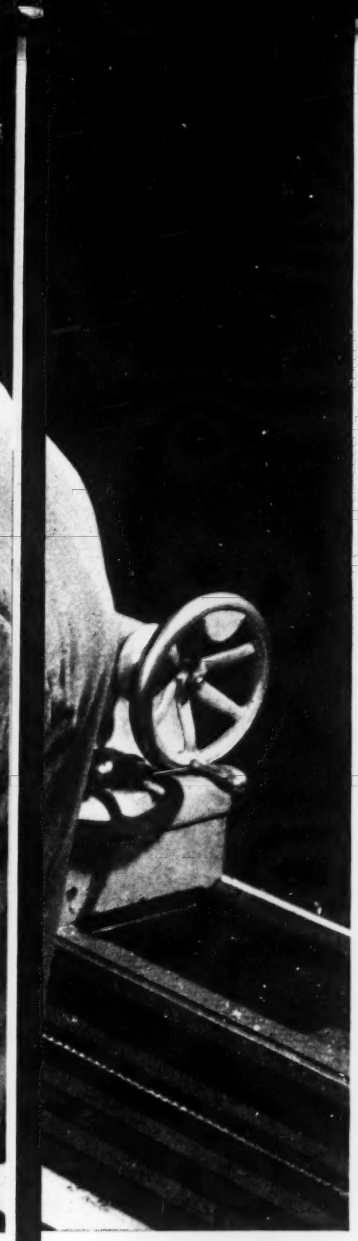
AMERICAN GAS FURNACE CO.
996 LAFAYETTE ST., ELIZABETH 4, N. J.

Stops tarnish on copper alloy jobs . . .

● Sciaky Brothers Inc., Chicago manufacturers of spot welding equipment, were having trouble obtaining a suitable finish on certain copper alloy parts. After they were machined, parts frequently had to be processed to remove stain or tarnish. This took time and labor and cut down production.

Upon the advice of a Standard Oil cutting oil specialist, officials of this company put a STANICUT Cutting Oil to work on the troublesome copper alloy machining jobs. It was the end for tarnish troubles. On a wide variety of operations employing many different copper alloys, STANICUT has provided both superior finish and excellent tool life. Of further importance to this company, STANICUT has been used with success on other jobs and, today, is employed for all operations requiring a cutting oil. This has eliminated the cost and trouble of stocking and using several different cutting oils.

To help you get better cutting oil results, Standard Oil has a metalworking service that is unique in the Midwest. It gives you the metalworking products, the engineering service, and the supply service that fit your special operation and needs. The cutting oil specialist serving in your section of the Midwest will be glad to tell you more about this personalized service. You can reach this man easily by phoning your local Standard Oil office.

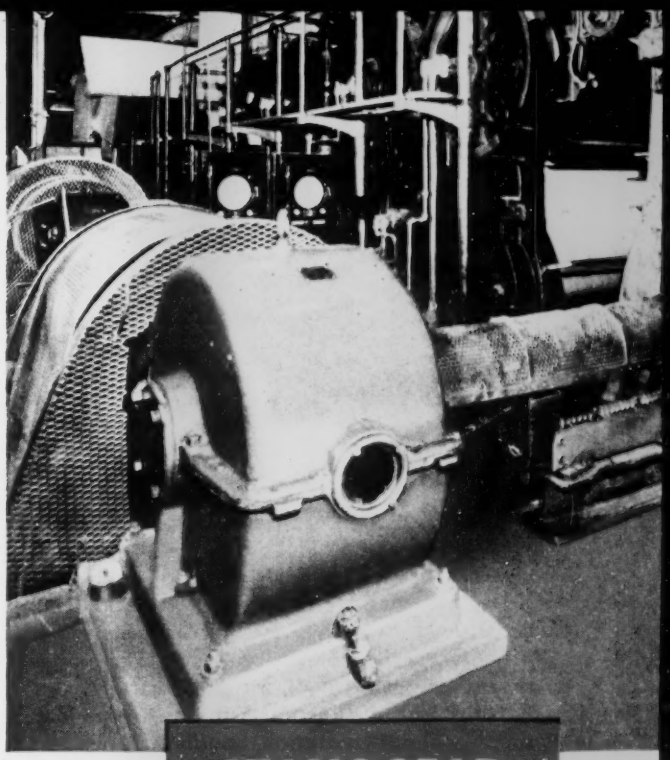


What's YOUR problem?

A. L. Seabaugh, who makes his headquarters at Standard's Chicago office, is the cutting oil specialist who recommended STANICUT Cutting Oil to operators of this midwest company and helped them solve a tarnish problem. Moreover, he has followed through on this problem to help his customer make additional cutting oil savings.

A. L. Seabaugh is one of a corps of able lubrication specialists who have headquarters in Standard offices throughout the Midwest. These men have been specially trained in Standard Oil Lubrication Engineering Schools and, in addition, have a wealth of practical experience. The specialist nearest your plant will work closely with you, giving you the help you need when you need it, to produce better cutting oil results.

You'll discover how easily and quickly you can obtain the services of this lubrication specialist by phoning your local Standard Oil office.



NEW

STANOGEAR
REG. U. S. PAT. OFF.
Compounds

7 ways better for extreme-pressure lubricating jobs!

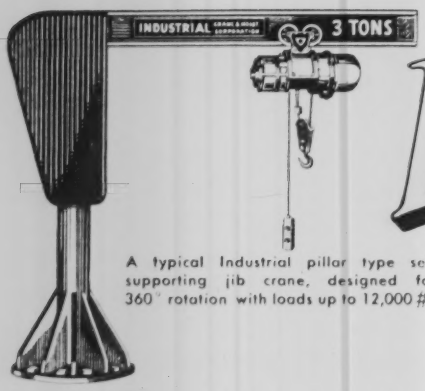
New and improved STANOGEAR Compounds have been developed to meet the requirements of the tougher extreme-pressure lubricating jobs found throughout industry, today. These outstanding products have proved their ability to provide these important advantages:

1. Higher load carrying capacity.
2. Superior retention of load carrying capacity.
3. Freedom from objectionable deposits.
4. Excellent storage stability.
5. Good water separation.
6. Anti-foaming.
7. Versatility.

The Standard lubrication specialist in your area of the Midwest can give you more information about the new STANOGEAR Compounds and help you apply them more effectively. Phone your local Standard Oil office. Or, write, Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Illinois.

STANDARD

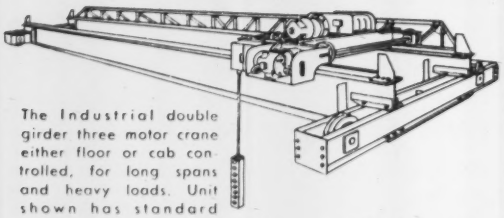
STANDARD OIL COMPANY
(INDIANA)



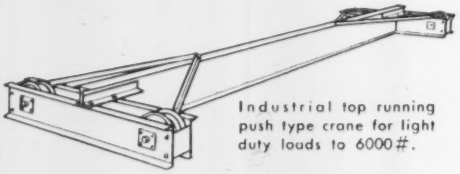
A typical Industrial pillar type self supporting jib crane, designed for 360° rotation with loads up to 12,000 #.

Industrial CRANES

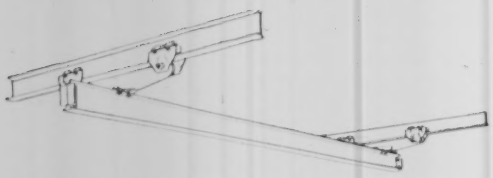
Industrial cranes are built in many types and sizes from small portable gantrys, up to 20 ton double girder motor driven overhead cranes all of welded steel construction. These cranes incorporate many patented features and are built to serve industry long and well. Consult Industrial Crane & Hoist Corporation for equipment that can simplify your material handling problems and increase your production.



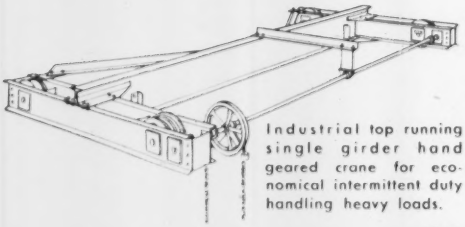
The Industrial double girder three motor crane either floor or cab controlled, for long spans and heavy loads. Unit shown has standard single outrigger; double outrigger provided for extra long spans.



Industrial top running push type crane for light duty loads to 6000 #.

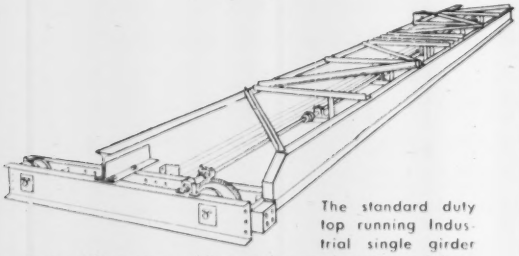


Industrial underhung push type crane for light duty—loads to 4000 #.

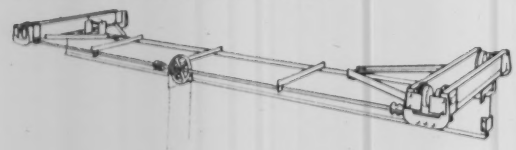


Industrial top running single girder hand geared crane for economical intermittent duty handling heavy loads.

The Industrial motor driven single girder underhung crane featuring the rigidity of outrigger construction. A standard design for loads up to 20,000 #.



The standard duty top running Industrial single girder motor driven crane with typical rugged outrigger bridge construction designed to efficiently handle loads up to 20,000 #.



The economical Industrial underhung single girder crane for loads up to 20,000 # on intermittent duty basis.

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INDUSTRIAL CRANE & HOIST CORPORATION

(formerly Industrial Equipment Co.)

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Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways

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FINE WIRE . . .

FOR FINE PRODUCT DETAILS

CONTINENTAL STEEL CORP. KOKOMO, IND.
STEEL
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ROUND and SHAPED WIRE

. . . For Rugged Use and Product Sales Appeal

Our wire people spend much of their time solving problems for folks who use wire in their operations. Continental is geared to produce a great range of wire shapes and sizes. Whether yours is a product-trim problem . . . or a basic or component part need—Continental may have just the wire you want. And one thing is sure . . . you will like the service, interest and the production follow-through you'll get at Continental. Just write or phone us today at Kokomo. You'll be glad you talked with Continental.

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Standard and Special Wire Shapes

FLAT	KEYSTONE-SHAPED
HALF ROUND	STAR-SHAPED
ROUND	HEXAGONAL
OVAL	GROVED FLAT WIRE
HALF OVAL	SPECIAL WIRE TRIM DESIGNS
SQUARE	
RECTANGULAR	BREAD-SHAPED
TRIANGULAR	D-SHAPED

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

(Advertisement)

The PROTECTION of ALUMINUM

Drawing courtesy of Piasecki Helicopter Corporation, Morton, Pennsylvania

THE H-21 Piasecki Tandem Helicopter—the "Work Horse"—is ideally suited for rescue work in areas inaccessible by other means, and in all kinds of rough weather.

For durable paint adhesion and high corrosion-resistance aluminum parts of the "Work Horse" are Alodized. The "Alodine" protective coating chemical bonds paint, extends paint life, and protects unpainted aluminum.

Because of its economy, effectiveness, and ease of application, the Alodizing process is finding wide-spread use in the aircraft field and in other industries fabricating products of aluminum.

Alodized aluminum meets the requirements of Military Specification MIL-C-5541. Write or call for coating and process data on "Alodine".

"Alodine" Trade Mark Reg. U. S. Pat. Off.

CHEMICALS ACP PROCESSES

AMERICAN CHEMICAL PAINT COMPANY

General Offices:

AMBLER, PENNSYLVANIA

Detroit, Mich. ***Niles, Calif.*** ***Windsor, Ont.***

"ALODINE" PROTECTS BOTH PAINTED AND UNPAINTED ALUMINUM

"Alodine" forms an amorphous non-metallic surface on aluminum which is thin, tough, durable, continuous with and a part of the basis metal. The "Alodine" film (or skin) anchors paint, prolongs paint life, and protects aluminum exposed unpainted to the atmosphere.

ALODIZING IS EASY AND EFFECTIVE

The Alodizing process is a chemical one and does not require electrolytic techniques or equipment. Alodizing is simple, fool-proof, low in cost, and requires a minimum of equipment. Essentially, the process consists of the following easily controlled operations or steps:

1. Cleaning the work.
2. Rinsing the cleaned aluminum surfaces.
3. Coating with "Alodine."
4. Rinsing with clean water.
5. Rinsing with warm "Deoxylyte" (acidulated rinse).
6. Drying.

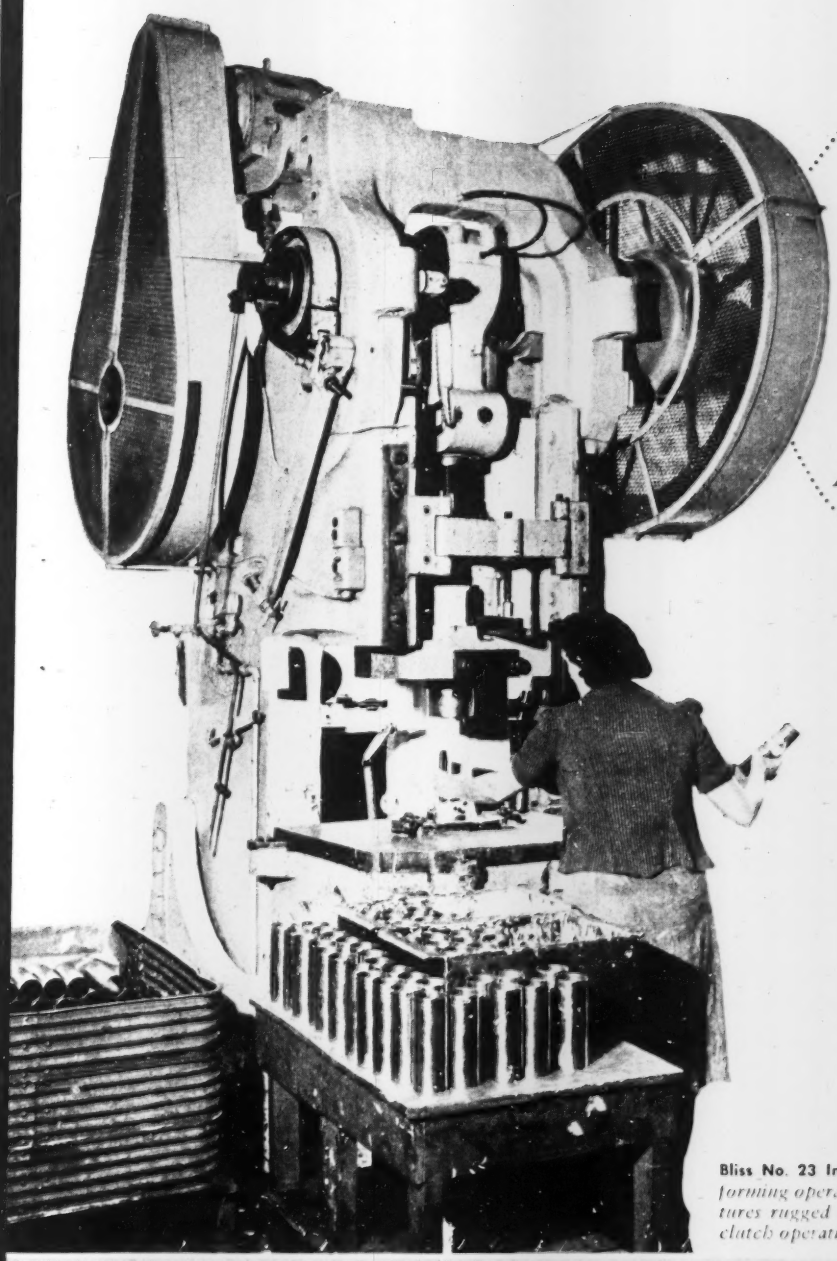
AFTER TREATMENTS: Alodized aluminum provides an ideal bonding surface for paint, wax, adhesive, or other organic finishes. These should be applied in accordance with the manufacturer's directions. Unpainted or exposed areas will be protected by the tough, durable "Alodine" skin.

"ALODINE" MEETS SERVICE SPECIFICATIONS

"Alodine" applied by immersion or spray complies with the rigid performance requirements of both industrial and Government specifications. The following is a list of Service Specifications which "Alodine" meets.

MIL-C-5541	U.S. Navord O.S. 675
MIL-S-5002	16E4 (SHIPS)
AN-E-19	AN-C-170 (See MIL-C-5541)
AN-F-20	U.S.A. 72-53 (See AN-F-20)

BLISS



Not a dime spent on maintenance in 8 years in Snyder's ALL-BLISS press shop

Snyder Manufacturing Co. of Philadelphia discarded all their old presses and equipped their shop 100% with Bliss inclinable and straight-side presses back in 1945.

That was a significant decision for the world's largest manufacturer of television and auto radio aerials.

Results? In the eight years that Snyder's press shop has been all-Bliss, they have not had to spend a *single* dime on maintenance of the 25 Bliss presses.

And, as the press room accident rate dropped to zero with the Bliss presses, operators found they could run the presses faster.

The Snyder story is not unique. Bliss is the dominant factor in press room after press room. For a complete press room or a single press for a given job, you'll find it's best to call in Bliss.

Bliss No. 23 Inclinable Press, *used by Snyder for forming operations on television accessories, features rugged construction, fast and dependable clutch operation.*

E. W. BLISS COMPANY, CANTON, OHIO

U. S. plants at Canton, Toledo, Salem, Ohio; Hastings, Michigan

E. W. Bliss (England) Ltd., Derby, England

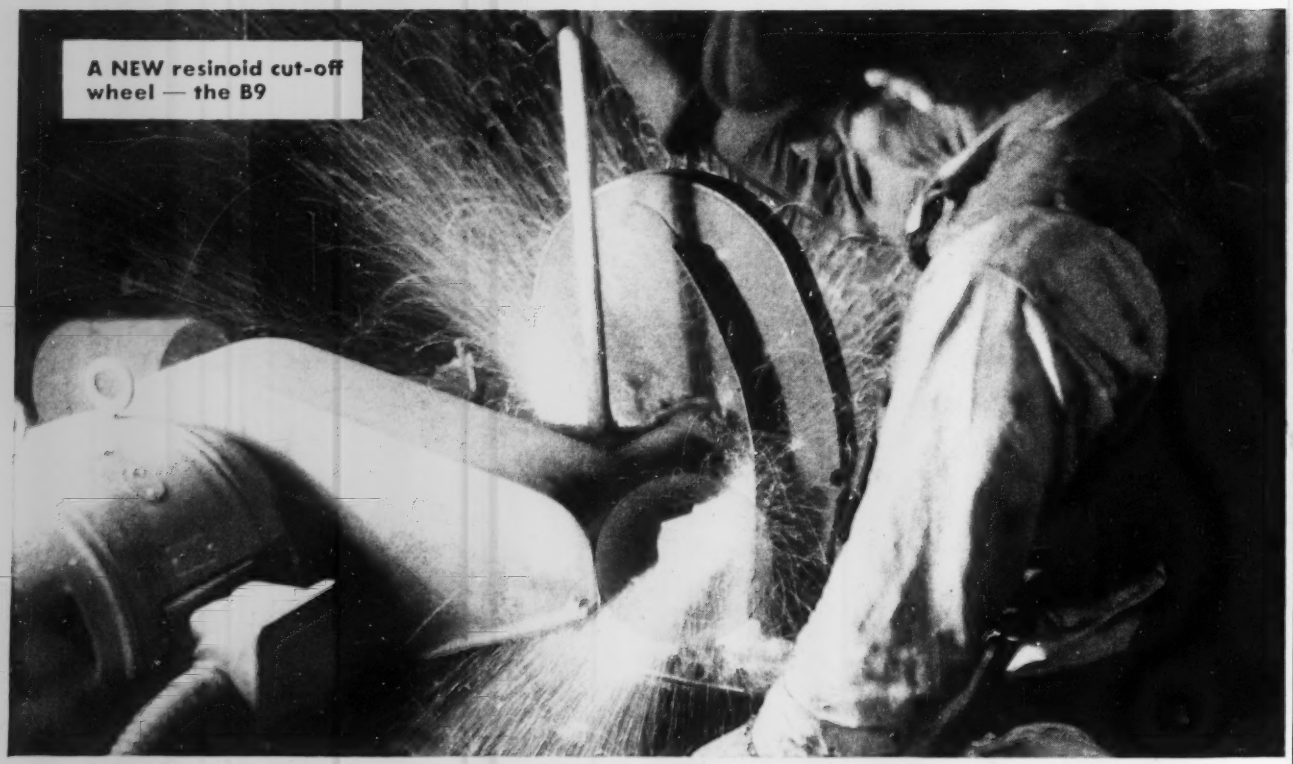
E. W. Bliss Company (Paris), St. Ouen sur Seine, France

PRESSES, ROLLING MILLS, SPECIAL MACHINERY

Branch offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo; and Toronto, Canada. West Coast Representatives: Moore Machinery Company, Los Angeles and San Francisco; Star Machinery Company, Seattle. Other Bliss representatives throughout the world.

BLISS

ON YOUR PRESS IS MORE THAN A NAME...IT'S A GUARANTEE!



The new B9 is as fast-cutting as they make 'em. Adaptable to speeds up to 16,000 surface feet per minute, the new Norton B9 cut-off wheel is a real production booster. Resinoid bonded and available with either smooth sides, or with the rougher "F" sides for greater chip clearance, it's a cool-cutting, non-burning performer on all types of metals.

Add the "TOUCH of GOLD" to all your cut-off jobs

Your cutting-off jobs may involve ferrous or non-ferrous metals of any degree of hardness — or non-metals ranging from rubber hose to marble. Your machines may be high speed or low speed — swing frame, chopper, traverse, floor stand or portable. The point to remember is:

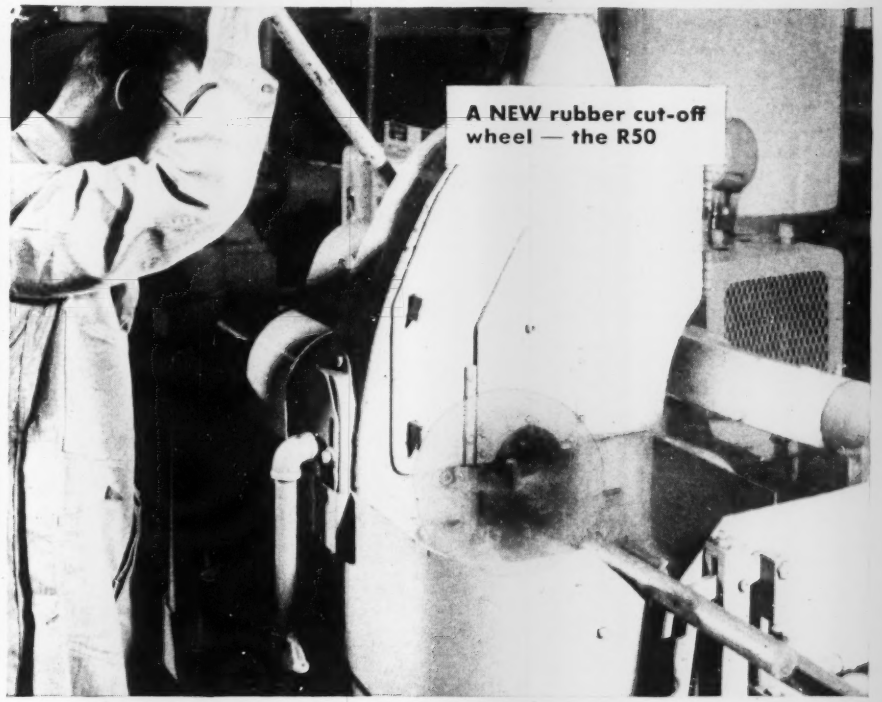
With the right Norton cut-off wheel you're sure of the fast, safe, clean-cutting performance that adds the profit-boosting "Touch of Gold" to every job.

Norton cut-off wheels are made with resinoid, rubber and shellac bonds, in ALUNDUM* (aluminum oxide) abrasive and CRYSTOLON* (silicon carbide) abrasive, and in a complete range of sizes. Whatever its type, you can count on every Norton cut-off wheel for the easy handling and exceptional breakage-resistance that mean happier operators and higher production.

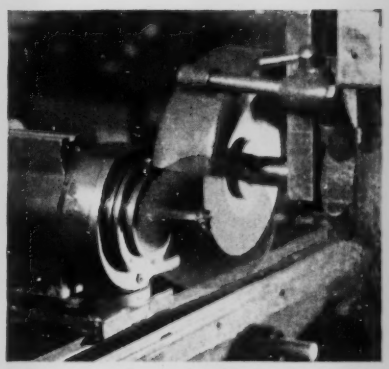
Your Norton distributor will be glad to recommend the *right* cut-off wheels for your jobs. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

NORTON
ABRASIVES
Making better products... to make other products better

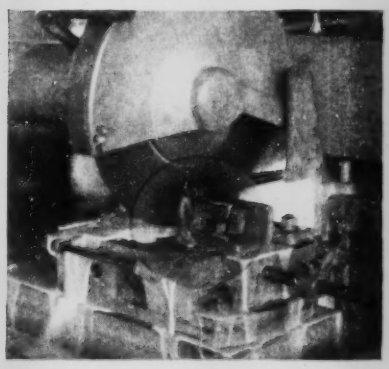
*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries



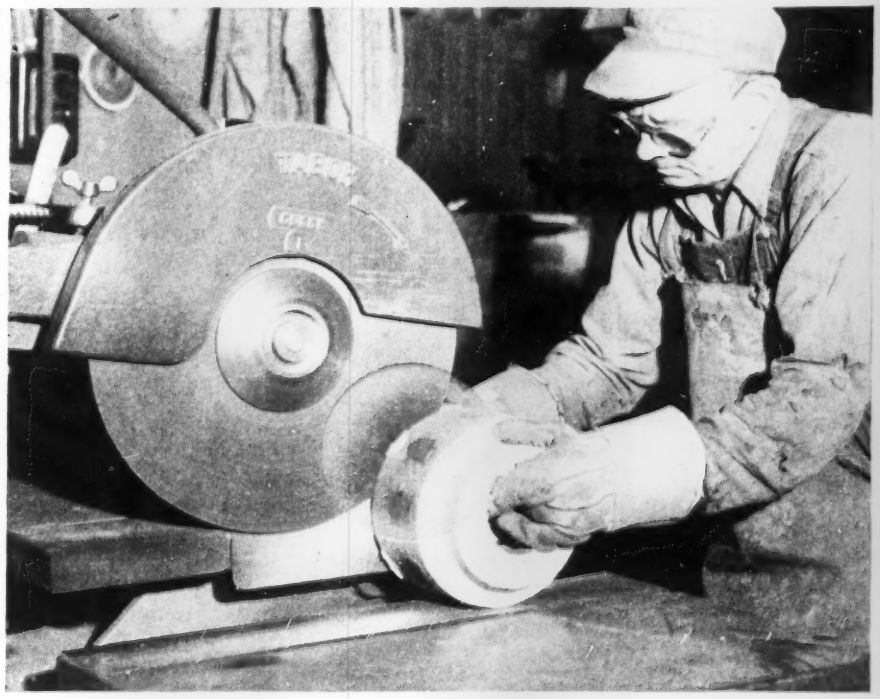
The new R50 has built-in chip clearance. Designed primarily for wet-cutting of metal bar stock, this new Norton rubber bonded cut-off wheel handles diameters up to $2\frac{1}{2}$" on chopper machines and up to 6" on oscillating machines. Built-in chip clearance, unusual in this type of wheel, is one of the reasons why the R50 cuts freer and cooler, without case hardening the ends of the stock.



The B2 is versatile. Handy as a general purpose cut-off wheel for the tool room, the Norton resinoid bonded B2 is also used for lighter jobs on plastics, marble, carbon, brake lining and other non-metals.



The R30 is standard. The bond used in the Norton R30 is the standard rubber bond for smaller wheels and is preferred for jobs such as cutting-off thin tubing, small diameter work and fine slotting.



The BN covers a wide job-range. You can't beat the long popular Norton BN wheel for general, all-around usefulness. Or for safety either, because the strong reinforcement of this resinoid bonded wheel practically eliminates breakage from the cutting-off picture. Uses include: notching, slotting and cutting-off gates and risers from non-ferrous castings; cutting wire rope; slotting railway track welds; tuck pointing; cutting non-metallic materials such as fibre board, concrete, tile, plastics, and the like.

The R20 is rugged. A very durable wheel, the Norton R20 has the strongest of rubber bonds. An ideal wheel for dry-cutting of metal rods and other jobs where dressing action is particularly severe.

A - 1520

R.D. Wood Hydraulic Presses

"... that industrial equipment which has maintained high excellence in manufacture will continue to be sold, and will contribute its worth to uplifting the general quality of everything produced in industrial America ..."

100 ton capacity heavy duty, all purpose open gap forcing press. Write for catalogs of our hydraulic presses.

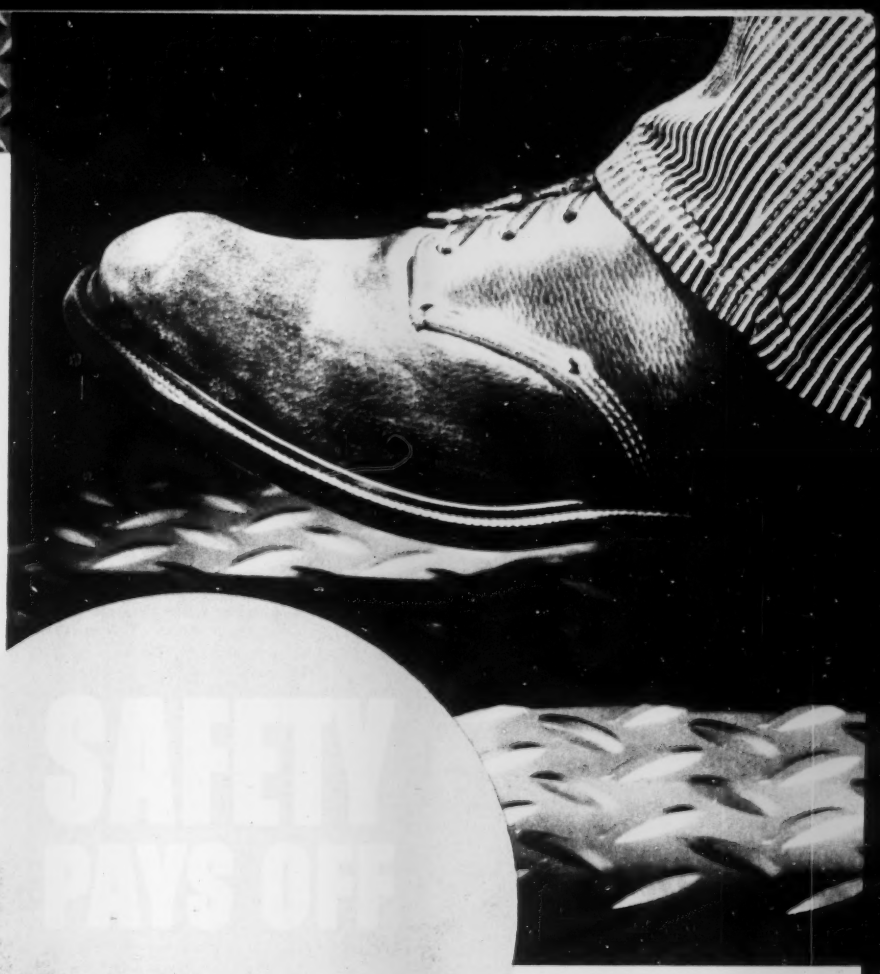
150th anniversary

WOOD

R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING, PHILADELPHIA 5, PA.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE • ACCUMULATORS • ALLEVIATORS • INTENSIFIERS



SAFETY PAYS OFF

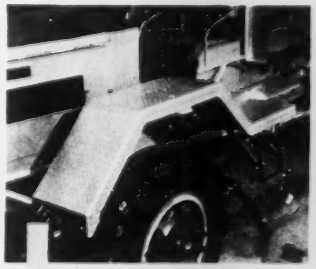
- Save Man Hours
- Pay Lower Insurance Rates
- Enjoy Better Fire Protection
- Have Happier Employees

with Industries' first choice of safety flooring-

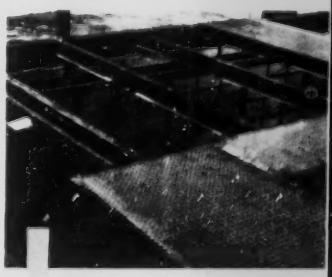
INLAND®

4-WAY safety plate

for replacement



on new equipment



in construction

4-WAY® safety plate

firesafe

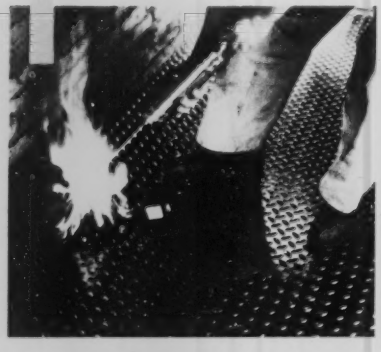
4-WAY is popular as a safety flooring in plants and for product use where fire hazards are a problem. Resists intense heat and shock with ease. Eliminates fire risk, reduces insurance costs.

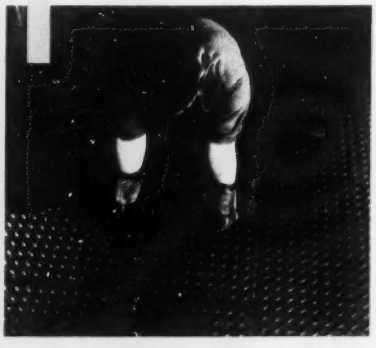
attractive

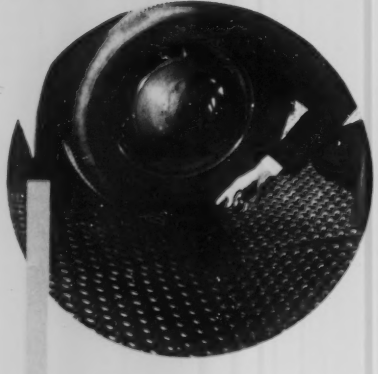
Popular demand for 4-WAY also results from its attractive appearance, eye-pleasing design. Pattern is uniform in all directions; pieces are easily matched. Looks good even after years of service.

economical

You'll be floored by 4-WAY's low cost! Initial cost is competitive with other flooring materials, installation cost may be less. Repair cost is practically eliminated. Maintenance is trouble-free.

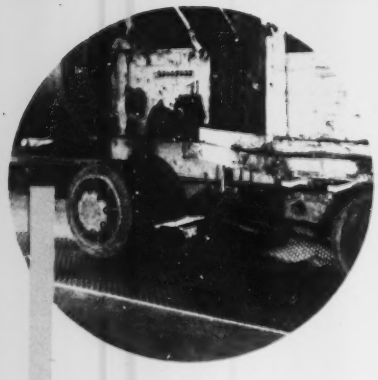






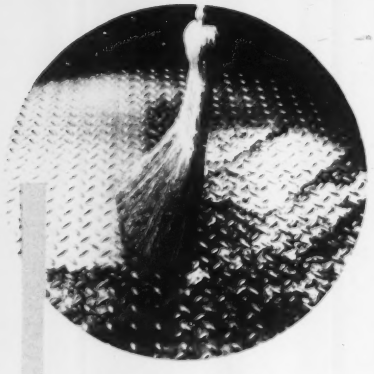
safe

Specially designed raise-lug pattern provides dependable all-weather traction for men and vehicles. STOPS and starts are made quickly, safely — *before* accidents get a foothold.



strong

Rough abuse and heavy loads are taken in stride by this tough, tried and proved steel plate. Made of finest rolled open hearth steel. Withstands great stresses.



cleans easily

Where cleanliness and sanitation are prime factors of importance, 4-WAY provides sanitary flooring with no dirt-catchers. Liquids drain away freely, are not absorbed. (Chemical resistant.) Won't splinter, chip or crack.

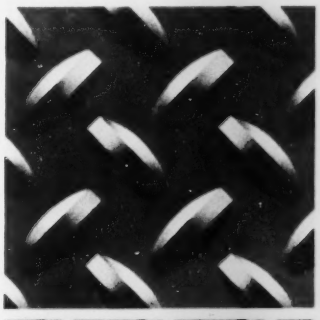
there's a 4-WAY® safety plate size and pattern

TO FIT YOUR NEEDS

Can be . . . Flame Cut • Sheared • Sawed • Drilled and Punched • Welded • Formed • Spot Welded

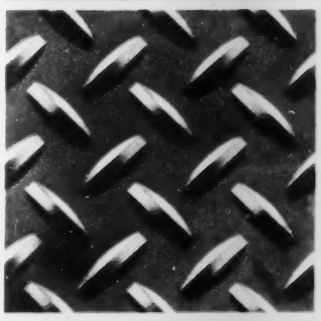
Goes down fast and flat, fits snug with a minimum of preparation. You have a safe floor surface ready for instant use.

Easy to fabricate and maintain—with the strength found only in steel. These and other advantages make 4-WAY the outstanding choice of industry. See how safety pays off when you use Inland 4-WAY safety plate.



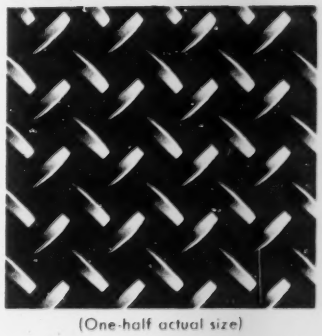
LARGE PATTERN

recommended for floors that must withstand tough abuse and heavy loads



MEDIUM PATTERN

the most popular and most versatile pattern for use in your plant or on your product



SMALL PATTERN

for applications requiring weight reduction or severe forming

(One-half actual size)

easy to fabricate

4-WAY can be fabricated by any of the conventional processes used on carbon steel plates. On-the-spot cutting, drilling or burning is readily accomplished with standard equipment.

MAIL for more information

CLIP THIS COUPON

INLAND STEEL COMPANY
38 South Dearborn Street
Chicago 3, Illinois

Gentlemen:

Please furnish me with the following information on 4-WAY safety plate:

☐ Catalog ☐ Availability and ordering information

Name Title

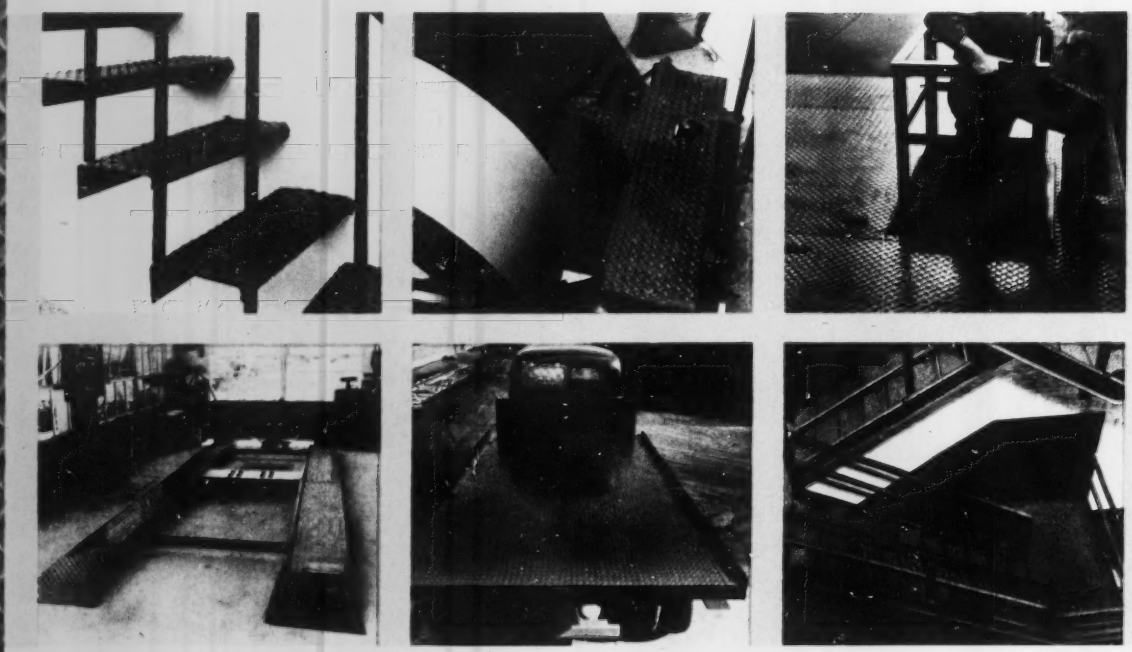
Firm

Address

City Zone State

A B C D E F G

Inland 4®-WAY safety plate



Actual use under the most trying conditions has proved Inland 4-WAY the versatile answer to flooring problems. Rugged, long lasting, it combines safety, strength, fire resistance and ease of maintenance all rolled into one. See for yourself how 4-WAY can safeguard you best and save you more. Send for the catalog that tells the complete 4-WAY story.

Stocked by leading steel warehouses throughout the U.S.A. and Canada

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: *Chicago, Milwaukee, St. Paul, Davenport, Kansas City, St. Louis, Indianapolis, Detroit, New York*

NEW YORK HERALD TRIBUNE, MONDAY, AUGUST 24, 1953

Rebuilt Carrier Hornet Is Ready for Jet Age

By Jack Tait

The Navy aircraft carrier Hornet, toughened up to handle a brood of latest-type jet planes by twenty-seven months of exhaustive conversion at the New York Naval Shipyard, Brooklyn, will be recommissioned on Sept. 11, 178 years after the first Hornet, a sloop armed with ten nine-pounders, joined the then puny American navy.

Originally commissioned in 1943 and inactivated in September, 1946, the Hornet will be unveiled nexth month as a 1953 model which will cost the taxpayers one-third the price of a new carrier. Comdr. J. R. Newland, superintendent of the Hornet reconversion job, stood on the dock the other day and looked up at the Hornet and said, "she sure looks like a mess now, but we'll have her ready in fourteen working days."

"The Latest Thing Now"

"She's the latest thing in carriers now," Comdr. Newland said, "but Lord only knows how long she will stay that way. They keep coming up with new planes. They make the planes bigger and faster and heavier. Well, all we can do is to try to keep up with them."

Almost ready—Workmen on the flight deck of the carrier Hornet are busy completing the twenty-seven-month job of bringing the ten-year-old ship up to date. The hero of Pacific battles in World War II was decommissioned in 1946. When she is recommissioned at the New York Naval Shipyard, Brooklyn, on Sept. 11, she'll be tough enough to handle modern jet aircraft.

If the Navy will rebuild a carrier, it's logical to—

Do the same with your machine tools

Today's tough-to-machine alloys, carbide tooling, tighter tolerances and higher speeds put your machine tools in the class of a 1940 aircraft carrier.

Take a tip from the Navy. They saved time and the taxpayer's money by rebuilding the *Hornet* to jet age standards. If it can be done with a carrier, it can be done with your machine tools, no matter how large. You can save time and your stockholders' money by rebuilding your machine tools for today's tougher work.

Savings: 50% or more of the cost of a new tool. Delivery time: a matter of weeks.

Make a comprehensive study of your machine tools and their production records. Those that aren't performing as well as they should ought to be rebuilt. Draw up a list of these machines and send it to Simmons. We will promptly reply and, if necessary, send an engineer to make an on-the-spot study of the tools to be rebuilt. Quotations made on fixed price or hourly basis—whichever is the more appropriate.

And remember—all machine tools rebuilt by Simmons are unconditionally guaranteed. Write or phone today.

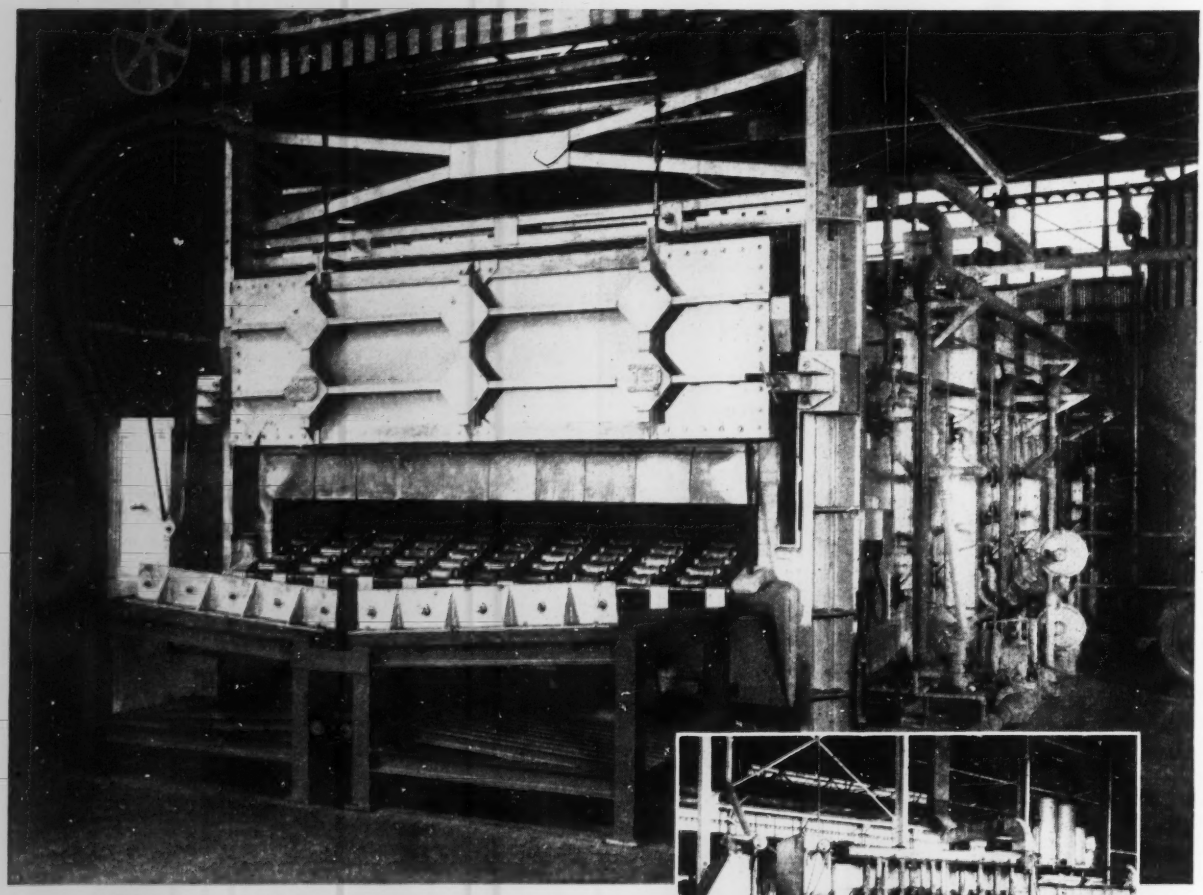
SIMMONS MACHINE TOOL CORPORATION
1755 North Broadway, Albany 1, New York
New York Office: 50 East 42nd Street
Phone in Philadelphia: Victor 8-3133 • in Pittsburgh, PEnhurst 1-3700

Engineered Rebuilding: a step-by-step process guaranteed to restore your machine tools to peak efficiency.*

- Machine tool completely dismantled – stripped down to bare castings and thoroughly cleaned.
- Machine is carefully studied to determine what must be done. Original manufacturer's specifications used as guide.
- All sliding surfaces checked for wear and refinished or replaced. (Ways, for example, can be replaced with new hardened steel ways, ground and hand finished.)
- All bearings inspected and tested, replaced with new in slightest case of doubt.
- Modernized features added, as required.
- When replacements for worn parts cannot be purchased, we design, machine and heat treat with our own equipment.
- Entire unit is repainted and assembled.
- Machine tool is tested and inspected under actual operating conditions and shipped only if it meets performance standards set by original manufacturer.

* *or modernize them for greater speed and capacity if you wish.*

SIMMONS
ENGINEERED
Rebuilding
GIVES MACHINE TOOLS A NEW LEASE ON LIFE

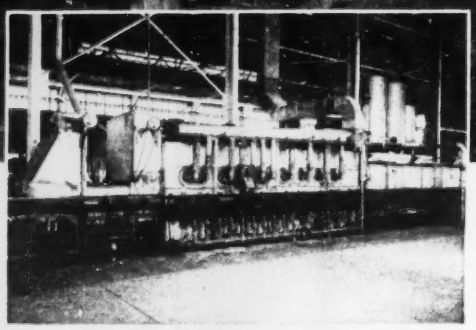


Gas-fired copper billet heating furnace, where billets are heated prior to processing.

AT

REVERE COPPER AND BRASS INCORPORATED

LOS ANGELES, CALIFORNIA



Dempsey Gas-fired annealing furnace in the Los Angeles plant of Revere Copper and Brass Incorporated.

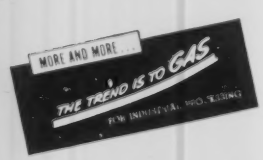
GAS is a production line tool

IN THE MANUFACTURE OF RODS AND TUBES for industrial, maritime, and plumbing applications, GAS provides the type of precision heat treating needed at Revere Copper and Brass Incorporated.

For instance, Revere eliminates the cold-draw cycle by using a Gas-fired annealing furnace to bring the billets right up to extrusion temperature. Bright annealing too is done by heat treating the copper tubing in controlled atmospheres in a large, Gas-fired furnace.

These methods of heat treating with GAS at Revere have the added advantages of automatic control, which makes it possible to maintain precise temperatures at all times with complete flexibility of operation.

Throughout *all* industry, GAS is a production-line fuel. Why not call your Gas Equipment Dealer or Gas Company Representative right away, and find out where GAS may help you improve the efficiency of your operation.



AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE, NEW YORK 17, NEW YORK

POP'S school of filing

THEY'RE SPECIAL PURPOSE FILE CUTS TO POP BUT A LOTTA FISH BONES TO STUPE!
STUPE CARRIES ONLY ONE IMPRESHUN OF A FILE!
YEAH, GOT IT SITTIN' DOWN WHEN THUH BOYS SLIPPED A HOT FILE ONTO HIS STOOL AT THUH SNACK BAR
?
HE THOUGHT IT WUZ UH PIECE O' BURNED TOAST. HAR!
STAN BANDA

Every Nicholson or Black Diamond Special Purpose file is designed to perform specific functions on specific operations found in thousands of America's industrial concerns.

Its initial purpose is to do a better mechanical job on certain kinds of materials than can be done with regular types of files. "Better" may mean faster speed, greater accuracy, smoother finish—or a combination of all three. Its *ultimate* purpose is to minimize wastes—in rejects, time, and money.

You can rest assured that each and every type of Nicholson or Black Diamond file must have had exhaustive design engineering, rigidly controlled manufacture, and thorough testing before it is given the "green light" to public use.

• • •

Your production and purchasing heads will find it definitely worth while to absorb the specific features and applications of the Nicholson Special Purpose files covered in "FILE FILOSOPHY" and "10 SPECIAL FILE TYPES." These are two illuminating pieces of literature which may be obtained without charge simply by writing for them. (The files illustrated above, left to right, are: For-Stainless Steel, Aluminum Type "A," Long Angle Lathe, Foundry, Lead Float, Curved Tooth, Super-Shear.)

NICHOLSON U.S.A.

NICHOLSON FILE CO. • 71 ACORN STREET • PROVIDENCE 1, RHODE ISLAND

(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

NICHOLSON ... A FILE FOR EVERY PURPOSE

How Oxygen...and LINDE SERVICE*

INCREASED INGOT YIELD BY UP TO 10%

As molten steel cools in ingot molds, it shrinks considerably. A cone-shaped "pipe" left in the top of the ingot is "waste" metal and must be removed before rolling. In the past, various methods have been tried to eliminate or reduce this "pipe."

One tool steel company has solved the problem with the aid of LINDE SERVICE. LINDE engineers designed an oxygen and natural gas system that has given the mill an increase in steel ingot yield of up to 10% over former methods. There are further savings, too, because operating costs are far less than for previous methods tried.

***LINDE SERVICE**

is the unique combination of research, engineering, and more than 40 years of accumulated know-how. This service is helping LINDE customers save money and improve production in their uses of oxygen and oxy-acetylene processes.

OXY-NATURAL GAS HOT-TOP HEATING

LINDE's oxy-natural gas method of heating metal is extremely simple to use. The equipment is made from standard parts and materials. There is no need for water cooling of blowpipes.

If your company uses oxygen, LINDE SERVICE *can mean dollar savings to you. We'll be glad to tell you more about it.*

LINDE AIR PRODUCTS COMPANY

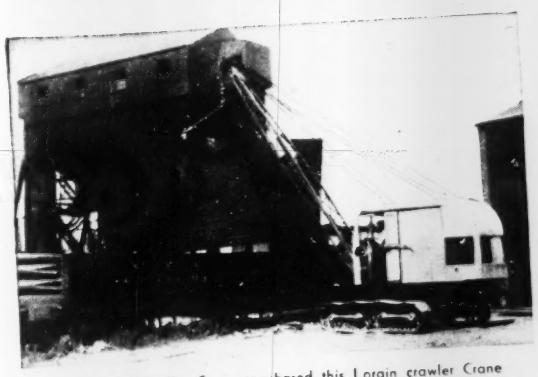
A Division of UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street New York 17, N.Y.

Offices in Principal Cities

In Canada: Dominion Oxygen Company, Limited, Toronto

Linde Trade-Mark



INCREASE *PRODUCTIVE* PLANT SPACE

1933 Pfaudler Corp., purchased this Lorain crawler Crane **(above)** and have used it profitably over these many years for the same basic material handling described below. This veteran sold them on Lorain quality.

1953 Now, this 10-ton Lorain "TL" Self-Propelled Crane, model SP-152, **(below)** gives Pfaudler Corp. the added advantages of rubber-tire mobility, 7 m.p.h. speed, air-steering and easy maneuverability.

. . . as Pfaudler Corp., Elyria, Ohio has for 20 years with *LORAIN CRANE METHODS*

Good yard crane practices can do more than give you low-cost material handling. Bonuses in such things as increased productive factory space are possible, too, as has been proved for many years by the Pfaudler Corp., at their Elyria, Ohio, plant.

This well-known manufacturer of glass-steel vessels and related equipment for the pharmaceutical, food and dairy industries bought a Lorain crawler Crane 20 years ago for yard material handling and just recently replaced it with a modern Self-Propelled Lorain, model SP-152, to get the added advantage of rubber-tire travel speed and mobility. They use a special gooseneck boom with plate clamp on their Lorain to unload cars of raw materials; such as, carbon steel plates up to 120" x 360" x 5/8", weighing 7500 lbs., transport them to storage rack and then to the plant door as needed for production. That's a normal sort of yard material handling job for a Lorain. But, they get a bonus advantage with their Lorain by reaching into the plant to pick up semi-fabricated steel tank jackets and transporting them to yard storage; then, moving them back into the plant as needed for production schedules — thus freeing valuable in-plant space for production. *No other type of material handling equipment could do this job as quickly, as easily, as economically.*

See your Thew-Lorain Distributor for details on Lorain Cranes — on rubber-tires and crawlers — 6 to 45-ton lifting capacities.

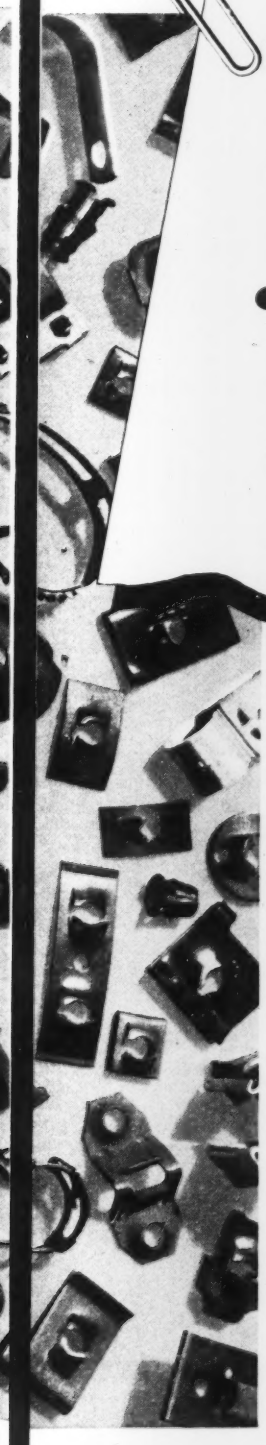
THE THEW SHOVEL CO., LORAIN, OHIO

ANOTHER INDUSTRY PROFITS WITH LORAIN

THEW LORAIN® *Cranes* FOR INDUSTRY

how Tinnerman Products solved

a tough heat-treating problem:



with Gulf Super-Quench

- minimum hardness was increased from 50 to 60 RC
- variation in hardness was reduced from ±5 to ±2 RC

on AISI C-1064 STEEL

Tinnerman Products, Inc., Cleveland, Ohio, manufactures a large variety of spring clips and spring fasteners of the type pictured at the left. These parts range in thickness from .01 to .062 inches and are all made of AISI C-1064 spring steel.

Normal heat treating practice calls for heating to 1600 deg. F. in a controlled atmosphere. The parts are held at this temperature for approximately ½ minute, then are transferred by a shaker-type conveyor into the quenching bath, which is held at 120 to 125 deg. F. After quenching, the parts are tempered at 700 deg. F.

When Tinnerman used a conventional quenching oil, hardness varied from 50 to 60 RC—too low and too variable for suitable performance characteristics. Examination of the steel revealed that in all cases it was within specification limits.

After investigating a number of other quenching oils, Tinnerman Products discovered one that is outstanding—Gulf Super-Quench. Tinnerman Products is now quenching all of these parts in Super-Quench with remarkable results. Hardness is never lower than 60 RC and averages 62 ± 2. This improvement was obtained without any change in quenching temperature, degree of agitation, analysis, or grain size.

If you, too, are looking for ways and means to increase the efficiency of your quenching operation, it will pay you to investigate the advantages of Gulf Super-Quench. Write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation · Gulf Refining Company

Pittsburgh 30, Pennsylvania

GULF SERVES INDUSTRY

"We can run Free-Machining ENDURO Stainless Steel Bars at about 90% of our Bessemer screw stock rate"

● Yes! You can switch the steel specification for a part from Bessemer screw stock to either of two grades of ENDURO Stainless Steel Bars (A.I.S.I. 416 and 430-F) with only a minor difference in your automatic production rate. These ENDURO Stainless Steel Bars, as cold-finished by Republic's Union Drawn Steel Division, are *fully 90% as machinable* as Bessemer screw stock. But now consider the plus benefits such a switch to ENDURO can give you!

Close tolerance, accuracy of section, uniform soundness, fine surface finish—to help you produce fine quality parts at highest production rates and at lowest costs. Plus the high strength of an alloy steel. Plus the stubborn resistance to rust and corrosion for which ENDURO is famous.

Free-machining ENDURO also is available in hot-rolled bars and wire. And experienced Republic metallurgists will offer you expert assistance in applying ENDURO Stainless Steel in any form. Just write:

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.

Republic ENDURO®
FREE-MACHINING
STAINLESS STEEL

REPUBLIC STEEL

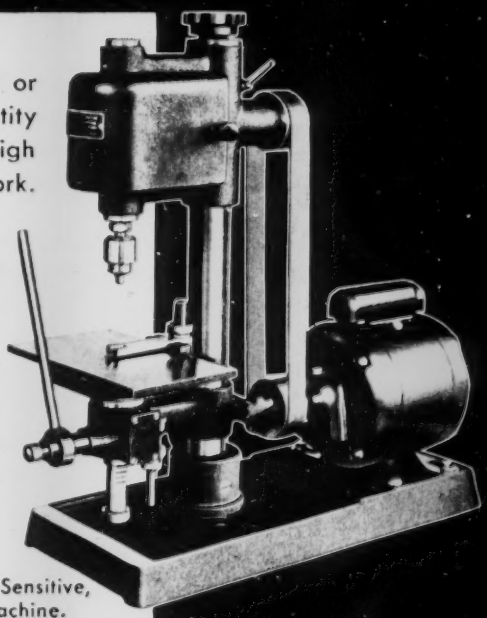
Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

YOU CAN DRILL OR TAP TINY, PRECISION HOLES . . . ON A *PRODUCTION* BASIS . . . WITH *MINIMUM* SCRAP AND *MINIMUM* TAP AND DRILL BREAKAGE

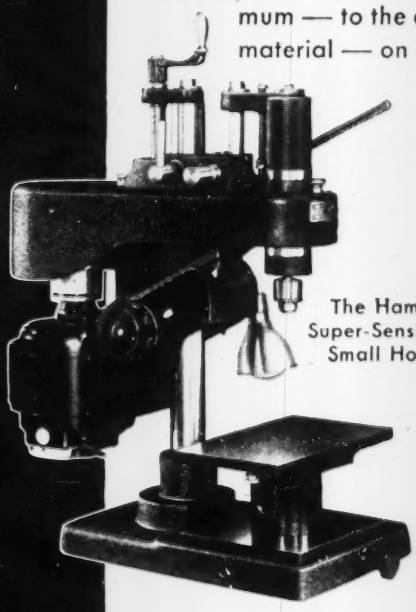
BUT YOU MUST FIT THE TOOL TO THE JOB

When your job calls for tiny, precision holes, drilled or tapped, rely on this; such holes can be produced in quantity and within allowed tolerances only on super sensitive, high precision machines **designed and built** for this class of work.

HAMILTON Drilling Machines and Tapping Machines are super sensitive and extra accurate; **designed and built** for the production of tiny, precision holes. The drilling machines produce holes **up to** 0.3125" maximum — to the center of 10" — in **any** drillable material — on fast production schedules. The tapping machine is designed to use the smallest and finest tap and **up to** 10-32 inclusive.



The HAMILTON® Super-Sensitive, Small Hole Tapping Machine.



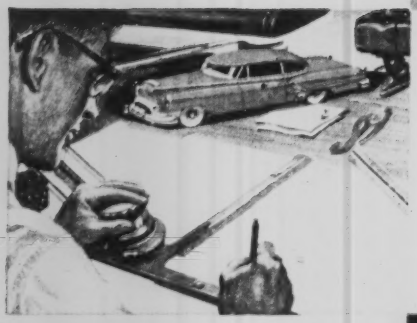
The Hamilton VARIMATIC® Super-Sensitive, Variable Speed, Small Hole Drilling Machine.

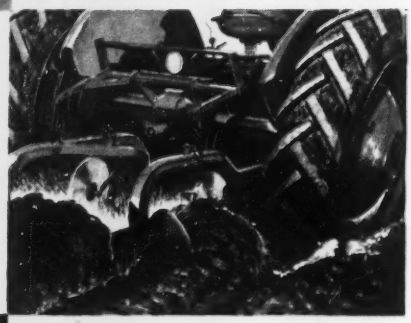
Multiple spindles also . . .

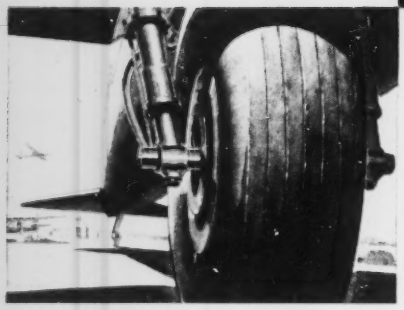
Acquaint yourself with Hamilton Super Sensitive, Small Hole Drilling and Tapping Machines and be ready for the challenge ahead. Ask for our FREE Bulletin DT-5308.

THE Hamilton TOOL COMPANY

848 SO. NINTH STREET • HAMILTON • OHIO • U • S • A







a basic material in better design

From industry's drawing boards come more and more plans for products using OSTUCO Steel Tubing. Strong, light weight, easy to form, OSTUCO Tubing is found in everything from shock-absorbers to sewing machines and tricycles to table lamps. Biggest users of OSTUCO Tubing are industries famed for their standards of high quality—manufacturers of aircraft, automobiles, appliances, electric products, tools, and machinery.

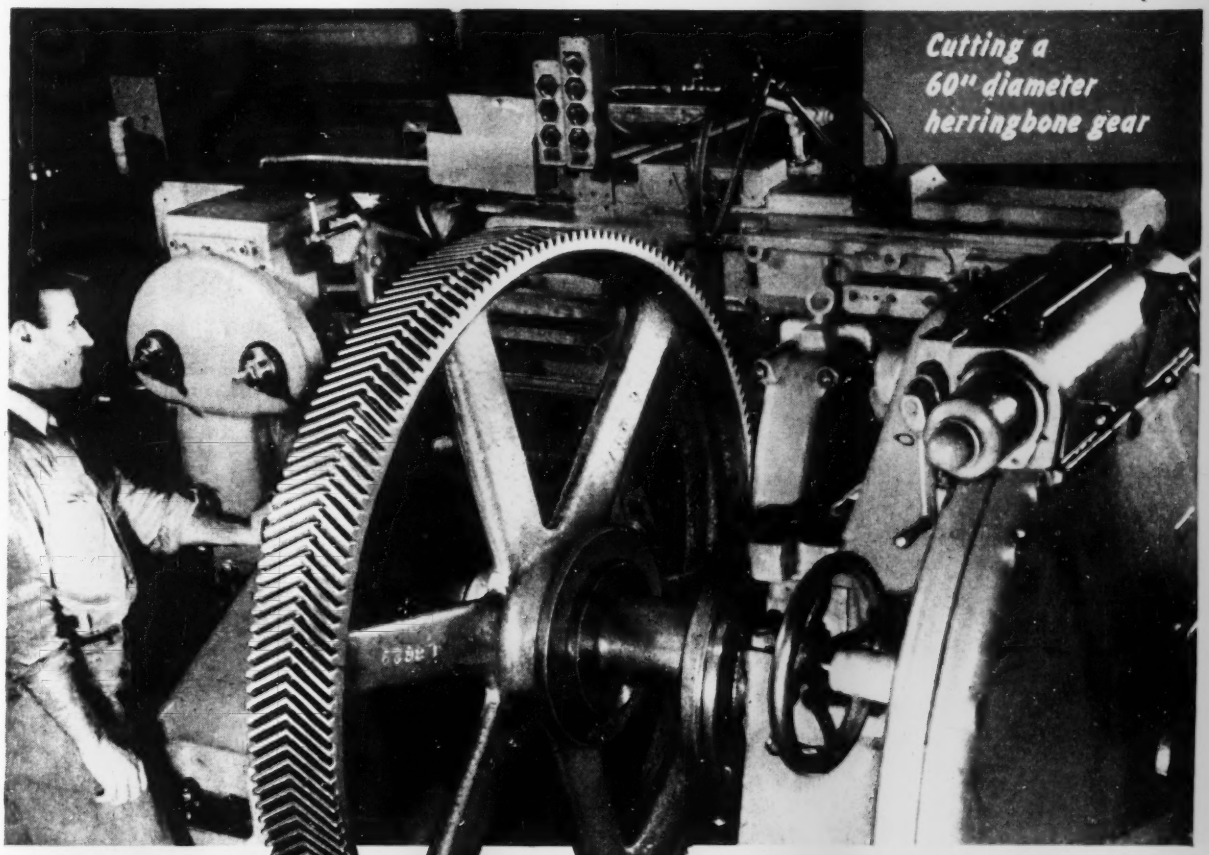
Having our own steel source as a member of the Copperweld family and with facilities modernized and greatly expanded, The Ohio Seamless Tube Company is now, more than ever, *your best single source* . . . a tubing specialist that manufacturers, forges and fabricates all at one plant. Consult our experienced engineers about OSTUCO Tubing for your current requirement or for redesigning your products. Write for new informative catalog, "Ostuco Tubing."

From Your Blueprint . . . to Your Product
OSTUCO TUBING
Tapering • Swaging • Flanging • Bending
Upsetting • Expanding • Reducing • Beading
End closing • Spinning • Drilling • Slotting
Notching • Flattening • Shaping • Trimming
Threading • Angle Cutting • And Many Others

OHIO SEAMLESS TUBE DIVISION
of Copperweld Steel Company
Manufacturers and Fabricators of Seamless and Electric Welded Steel Tubing
Plant and General Offices: SHELBY, OHIO

OSTUCO SHELBY, OHIO

SALES OFFICES: Birmingham, P. O. Box 2021 • Chicago, Civic Opera Bldg., 20 N. Wacker Dr. Cleveland, 1328 Citizens Bldg. • Dayton, 511 Salem Ave. • Detroit, 520 W. Eight Mile Road, Ferndale • Houston, P. O. Box 17007 • Los Angeles, Suite 300-170 So. Beverly Drive, Beverly Hills • Moline, 617 15th St. • New York, 70 East 45th St. • Philadelphia, 2004 Packard Bldg., 15th & Chestnut • Pittsburgh, 1206 Pinewood Drive • St. Louis, 1230 North Main St. • Seattle, 3104 Smith Tower • Syracuse, 2350 Bellevue Ave. • Tulsa, 245 Kennedy Bldg. • Wichita, 622 E. Third St. • *Canadian Representative:* Railway & Power Corp., Ltd.



Herringbone gears

Cutting a big herringbone gear like this isn't particularly difficult —that is, if the right equipment and experienced operators are available. Here at BRAD FOOTE we have a happy combination of efficient machines and capable men to cut any size, any type, or any quantity of herringbone gears you might need.

• Then comes the finishing. Your specifications may call for heat-treating, flame or induction hardening, or perhaps shot-peening. All these and other special processes are available in BRAD FOOTE'S own shops. We control every operation on every gear, gearmotor, transmission, or assembly which you order from us. No one shares our responsibility.

• Close attention to details, complete manufacturing facilities, careful inspections, and strict adherence to specifications are your assurance of high quality in all BRAD FOOTE gears. So you can order with utmost confidence the gears you need for your own use or for resale on equipment you make for others.

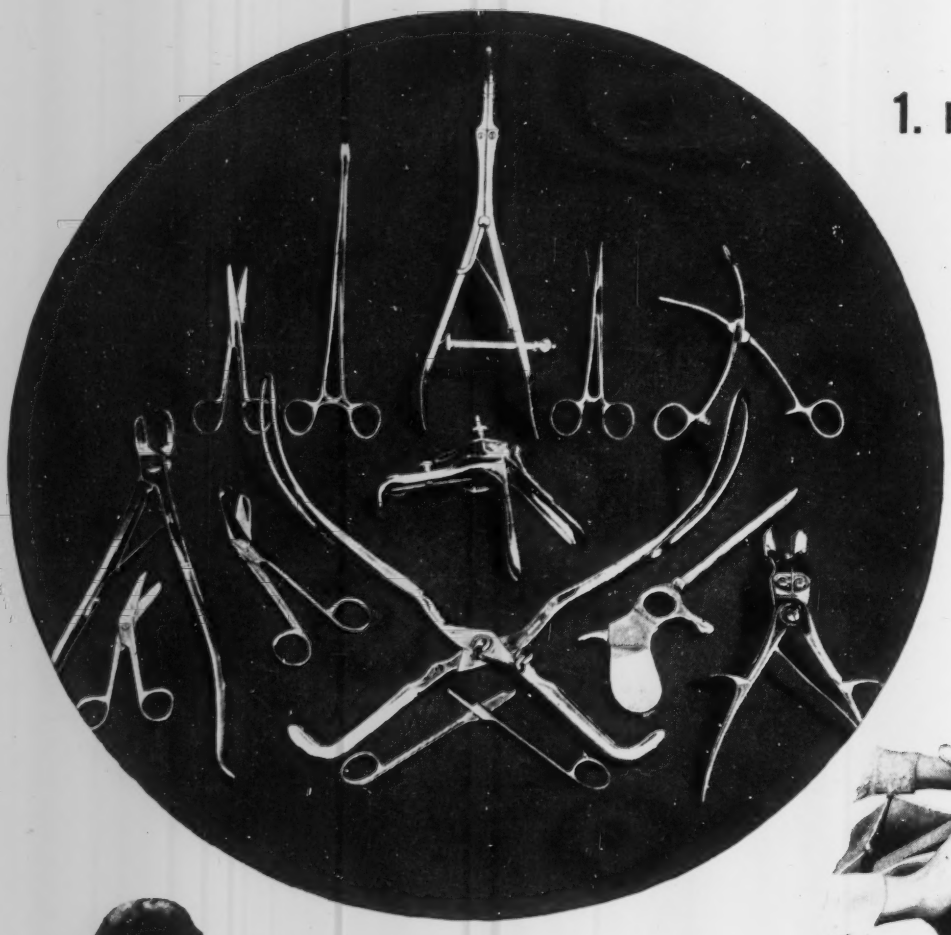
• Next time you need gears, send us the specifications so we can quote you promptly.

BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois
BIshop 2-1070 • OLympic 2-7700

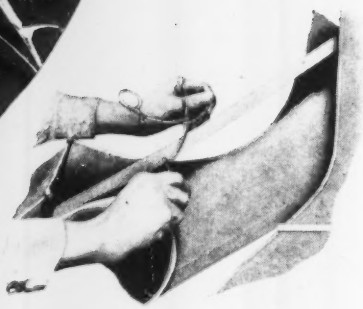
subsidiaries | AMERICAN GEAR & MFG. CO. • Phone: Lemont 920 • Lemont, Illinois | PITTSBURGH GEAR COMPANY • Phone: ATlantic 1-9950 • Pittsburgh 22, Pennsylvania

HOW WOULD YOU SOLVE IT?



1. PRODUCTION PROBLEM:

To produce a more uniform finish on the multiple contours of stainless steel surgical instruments and cut unit costs of finishing and polishing. Witte & Schmitz Surgical Instrument Co. was using set-up wheels which left unsatisfactory finishes, tired operators.



2. SOLUTION:

A 3M Representative suggested that this Bridgeport, Conn. manufacturer switch to the 3M Backstand Method using Three-M-ite "Resinite" and Three-M-ite Cloth Belts. A 3M Methods Engineer helped the firm make up their own spindles and mounted wall idlers to make best use of limited space.

3. RESULTS:

An immediate 25% production increase with a far superior finish on the instruments. Too, the manufacturer found that unskilled workers could be trained to polish the multiple contours more rapidly, and there was less operator fatigue. 3M Representatives can help solve *your* grinding problems, too. Send coupon for facts.

WANT MORE INFORMATION?

Minnesota Mining & Mfg. Co.
Dept. S-103, St. Paul 6, Minn.

[ ] Send me free booklet, "Case History Reports on 3M Abrasive Belts."
[ ] Have 3M Representative call.

Name Title

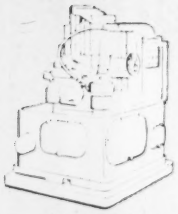
Company

Address

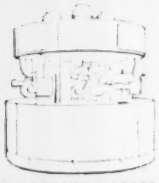
City Zone State

3M® ABRASIVES

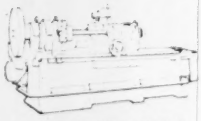
Made in U.S.A. by Minnesota Mining & Mfg. Co. General Offices: St. Paul 6, Minn. In Canada: London, Ont., Can. Export: 122 E. 42nd St., New York City. Makers of "Scotch"® Pressure-sensitive Tapes, "Scotch"® Sound Recording Tape, "3M"® Adhesives, "Underseal"® Rubberized Coating, "Scotchlite"® Reflective Sheeting, "Safety-Walk"® Non-slip Surfacing.



12-5 HOBBER

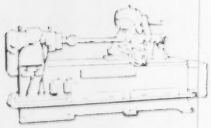


7-A ROTARY HOBBERS

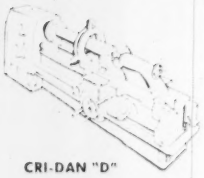


SH SPLINE HOBBER

MODEL 40 THREAD MILLER



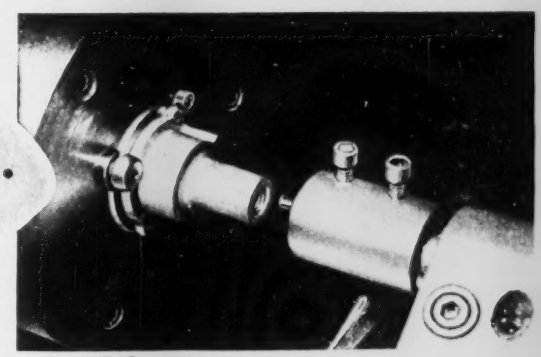
HT THREAD MILLER

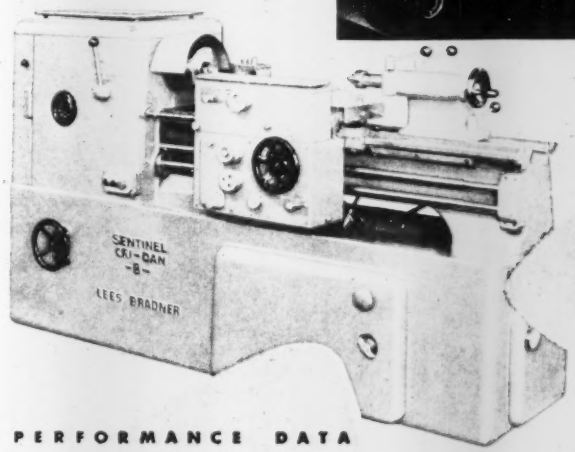


CRI-DAN "D"

CRI-DAN "B"

SMALL PART...





BIG SAVINGS

PERFORMANCE DATA

Material	Die cast aluminum
Thread produced	⅝"-18 UNF 2B internal
Thread length	⅜" full thread
Depth C'bore for thrd.	7/16"
RPM	2000
Number passes req'd	8
Type tool	Carbide
Approx. pcs per grind	7500
Cutting time	8 seconds
Floor to floor time	15 seconds

with the CRI-DAN "B"

SINGLE POINT THREADING MACHINE

● Again, the Cri-Dan Threading Machine proves its amazing efficiency.

This small aluminum casting, formerly threaded on a tapping machine was set up on the Cri-Dan "B". The finished casting required a ⅝"-18 class 2B internal thread cut to within 1/16" of the shoulder. When the Cri-Dan "took over," the scrap loss due to concentricity was completely eliminated, thread depth was consistently maintained and overall production increased.

This case history of a leading manufacturing company* proves again that your Lees-Bradner representative can help increase your savings on threading operations. Contact him today.

*name on request

the LEES-BRADNER® Company

CLEVELAND 11, OHIO, U.S.A.

Suppose we put the Dempster-Dumpster System right down in your plant . . . then what?

● *Well First—let's make it clear that we are furnishing you with several sizes of different designs of 26 containers to suit your materials requirements. Then bear in mind that we are delivering you only one truck-mounted Dempster-Dumpster and with your driver this one outfit picks-up, hauls and dumps all containers, about like the one shown above.*

Now, how many conventional trucks are you using for handling rubbish, scrap, raw materials, and what have you?

For several years now, one plant has been doing considerably more work with two Dempster-Dumpsters and two men than they did with five trucks and fifteen men before the Dempster-Dumpster System was installed. You can guess at the approximate savings annually.

A glance at the picture below and you get the whole story of the Dempster-Dumpster System. Never before have you been able to cut bulk materials handling costs so drastically.

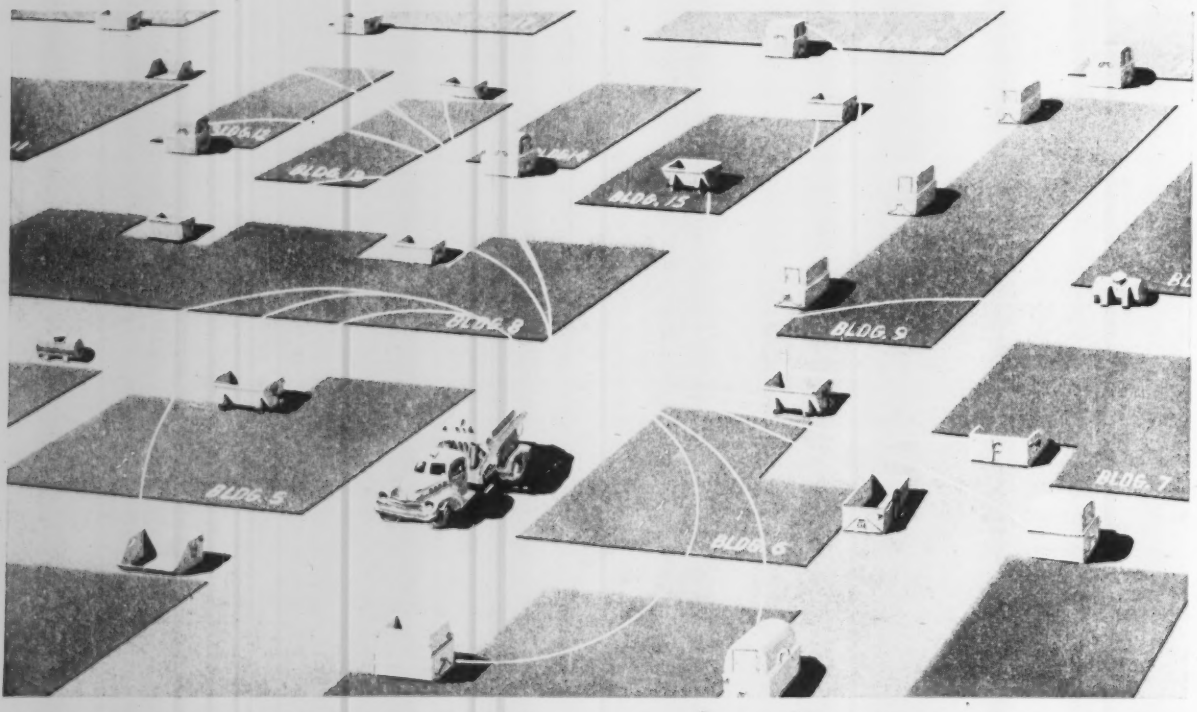
One truck mounted Dempster-Dumpster handles the entire group of 26 Dempster-Dumpster containers. These big, detachable steel containers are like having 26 truck bodies for a single truck.

Any required number of Dempster-Dumpster containers are spotted at convenient materials accumulation points inside and outside your buildings. They range in sizes up to 12 cu. yds.—3 to 4 times the capacity of a regular dump truck. Materials—bulky, light, heavy, solids, rubbish and even liquids—are dumped or placed into these containers.

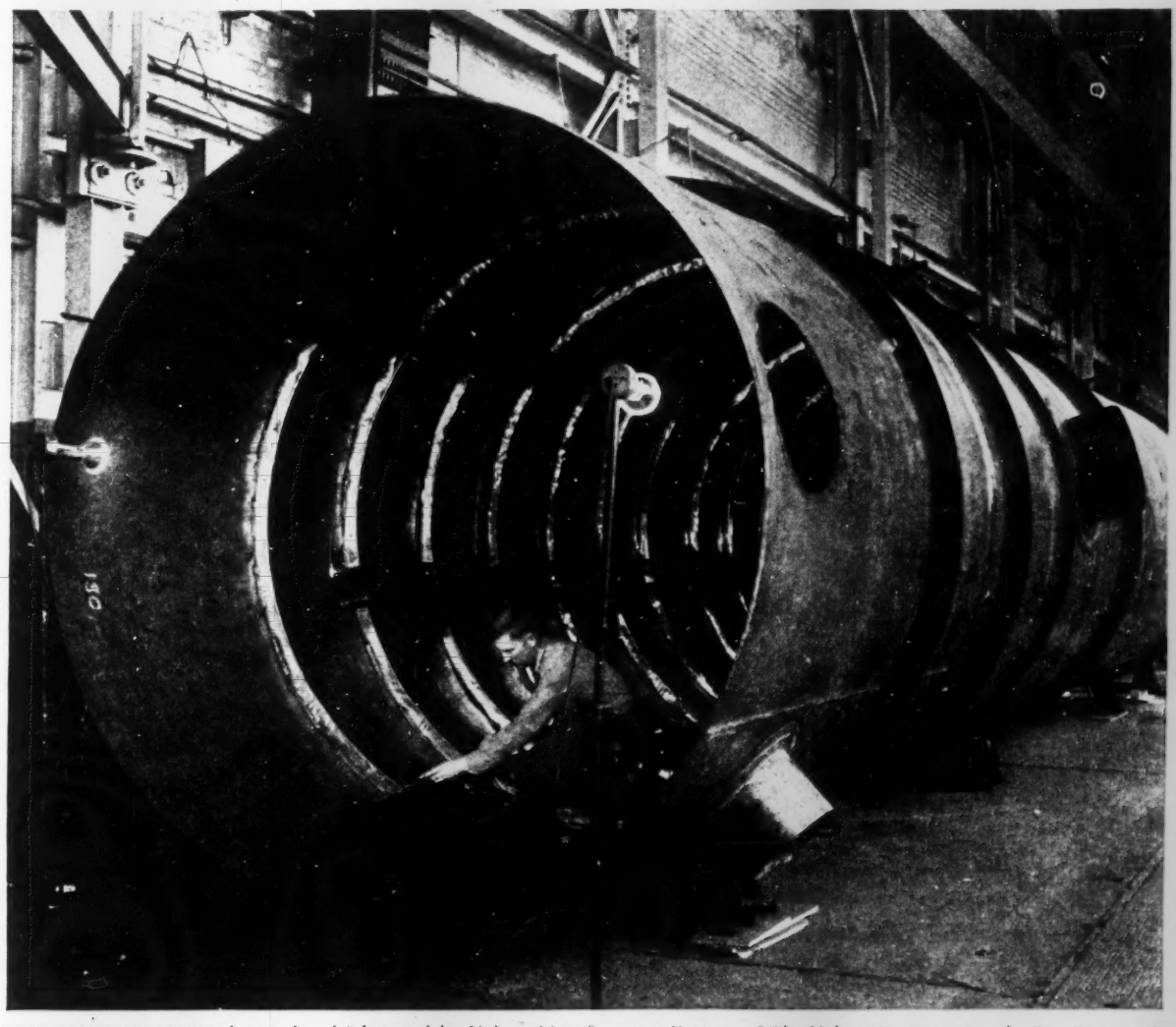
The truck mounted Dempster-Dumpster makes scheduled rounds, picks up each preloaded container, carries it to the point of disposal, sets it down intact or dumps the materials and returns the container for refilling. The entire operation is hydraulically controlled and handled by your truck driver.

It's as simple as we have described it. The amazing thing is the tremendous savings being made by the Dempster-Dumpster System in hundreds of leading industrial plants over the nation.

A product of Dempster Brothers, Inc.



DEMPSTER BROTHERS, 6103 Dempster Bldg., Knoxville 17, Tennessee



FRACTIONATING TOWER designed and fabricated by Vulcan Manufacturing Division of The Vulcan Copper & Supply Co., Cincinnati.

COPPER–select it for performance–fabricate it at low cost

This is a fractionating tower 30 feet long and 10 feet in diameter—and it's made entirely of phosphorized copper.

Copper and its alloys are logical choices for building many kinds of process vessels because their complete immunity to rust and high resistance to corrosion are important assurances of long equipment life.

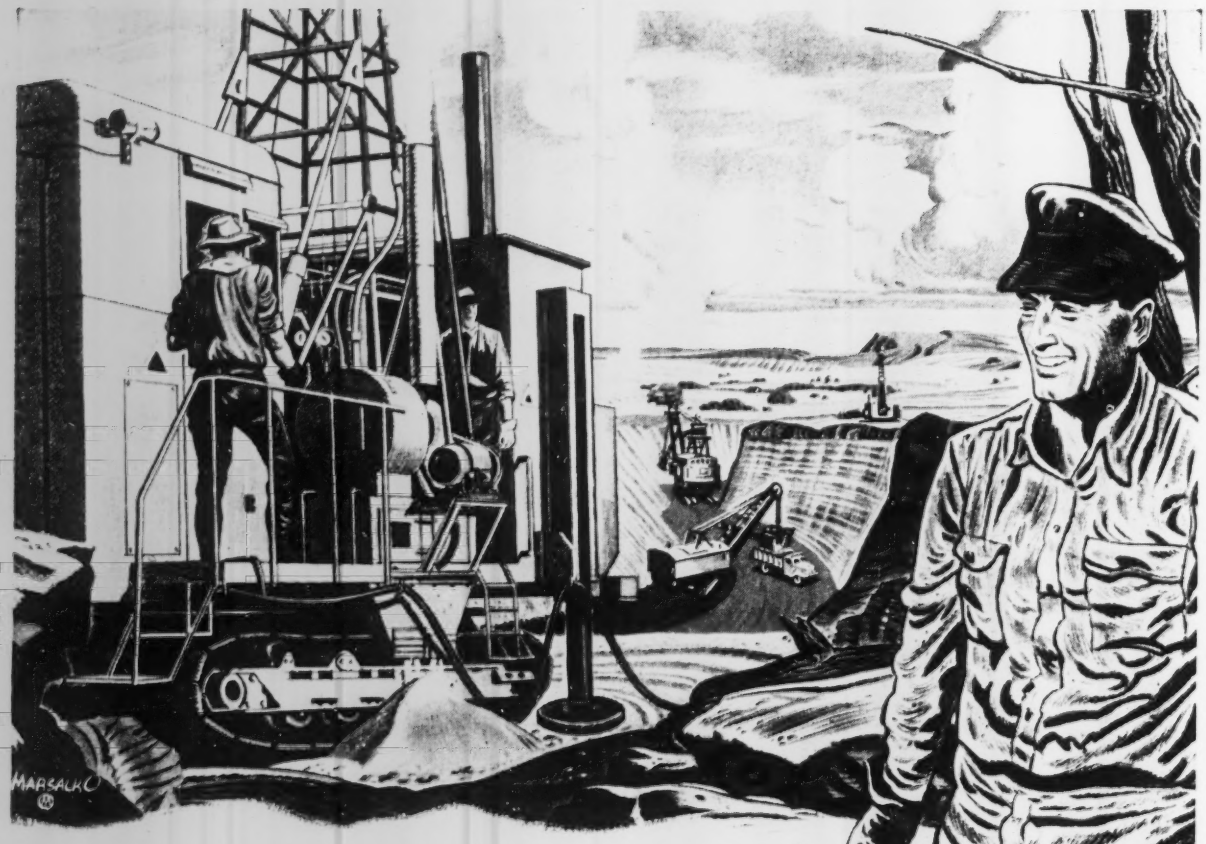
And more than that, the practicability of fabricating copper with the new automatic welding methods helps keep down the costs of equipment. The many components of this tower, with metal thicknesses ranging from ¼" to ½", were rapidly assembled by the inert-gas consumable-electrode method. The welding rod was ANACONDA Copper-372". Routine X-ray inspection showed consistent soundness of the finished welds.

In designing or specifying your process equipment, consider the unique combination of properties which only copper and copper alloys offer in such high degree. These include rapid and uniform heat transfer and ready workability, combined with good mechanical strength and resistance to fatigue.

For detailed information or for technical counsel on any form of copper or type of copper alloy, or any problem related to their use in your business, the services and experience of our Technical Department are always available. Just write to *The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.*

for copper and its alloys—consult

ANACONDA



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THAT MOVE MOUNTAINS

can move production to a new high in your business

Electric motors with on-the-job dependability are just as important in mining as in *your* business. That's why the builders of this blast-hole drilling machine specified Reliance Precision-Built Motors. Exposed to heat, cold, and the elements, blasted by abrasive rock dust . . . the rugged Reliance motors deliver the steady, unfailing performance that has made them first choice of management and production men for the toughest jobs in all industries.

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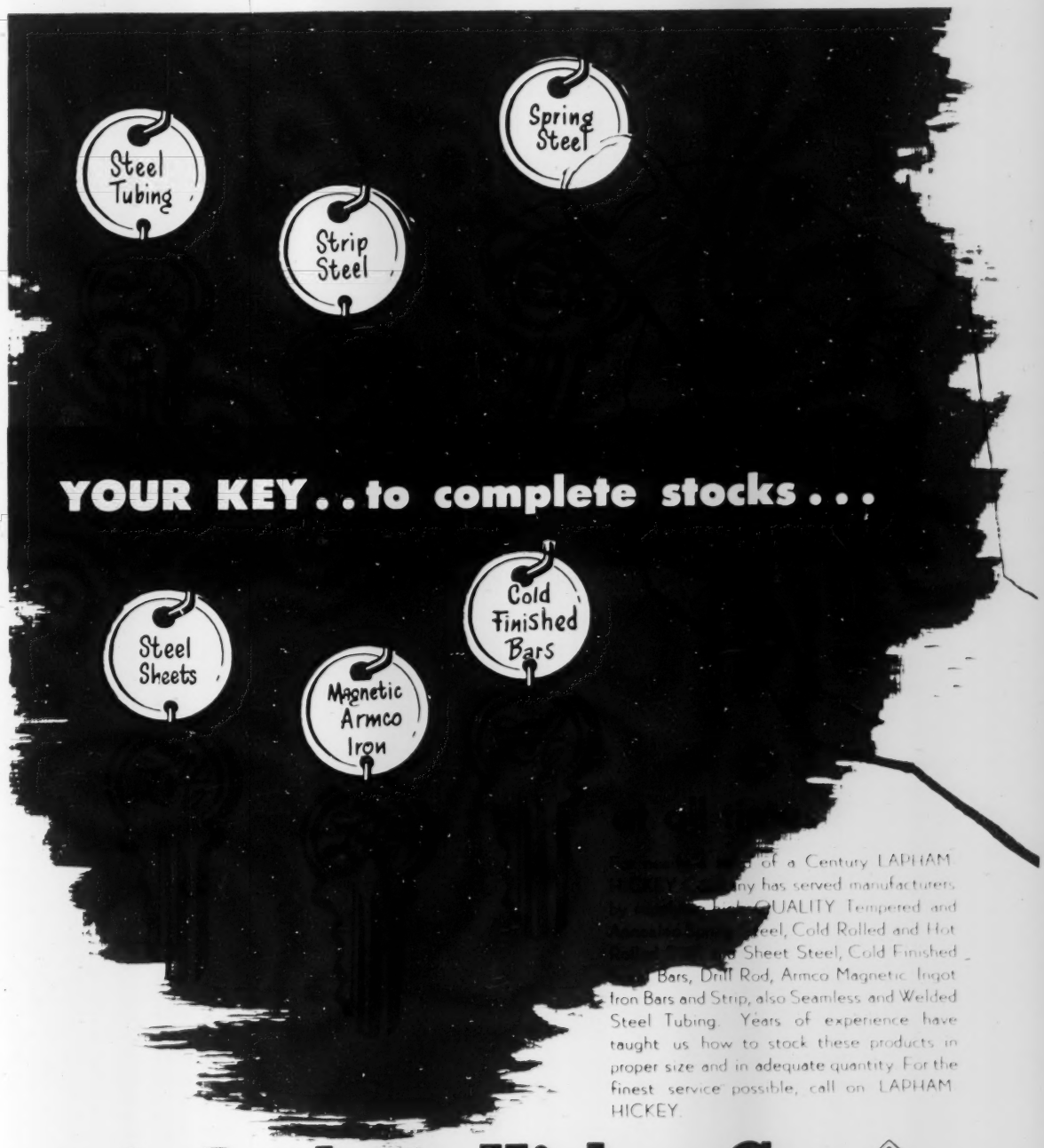

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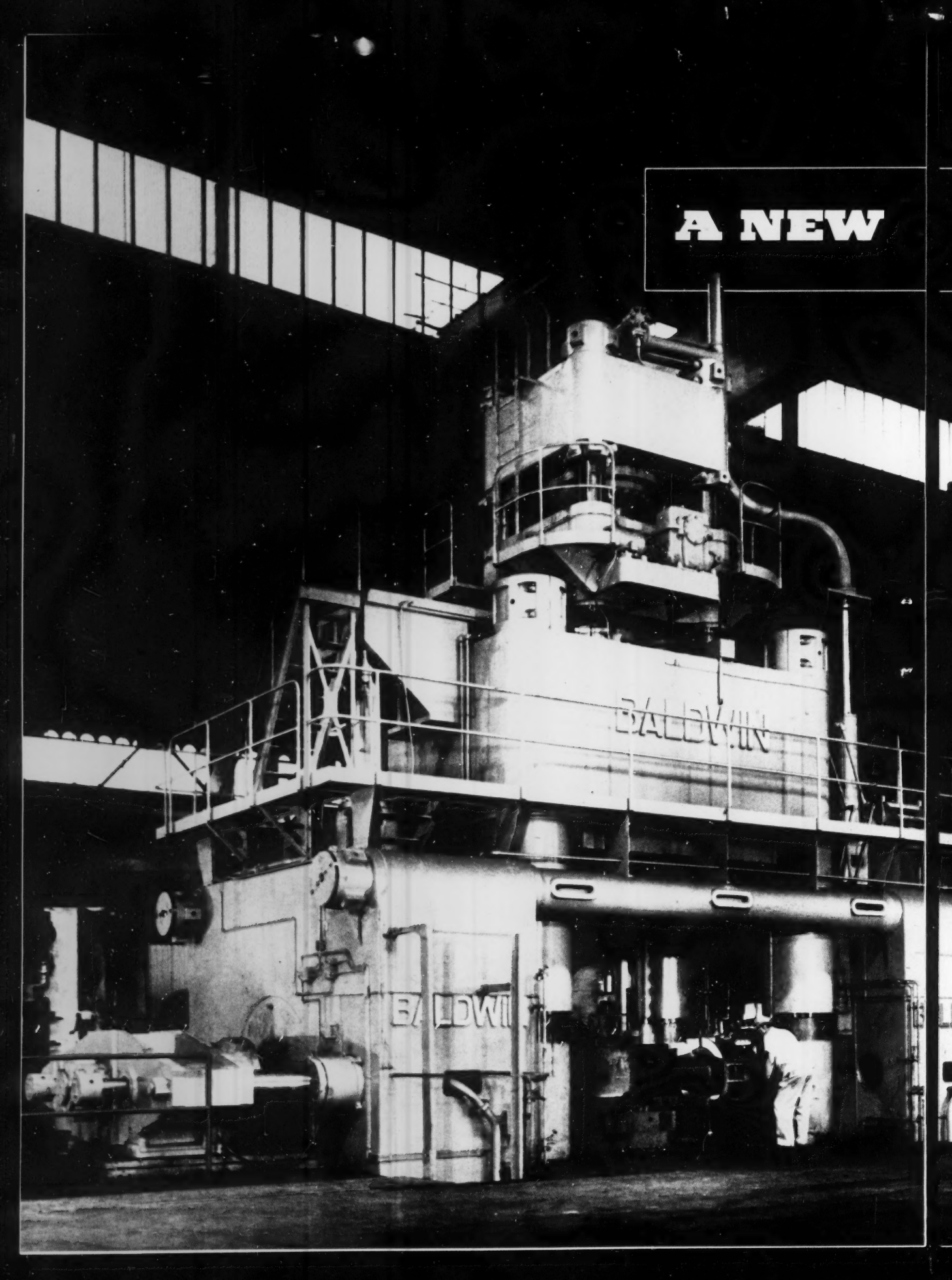
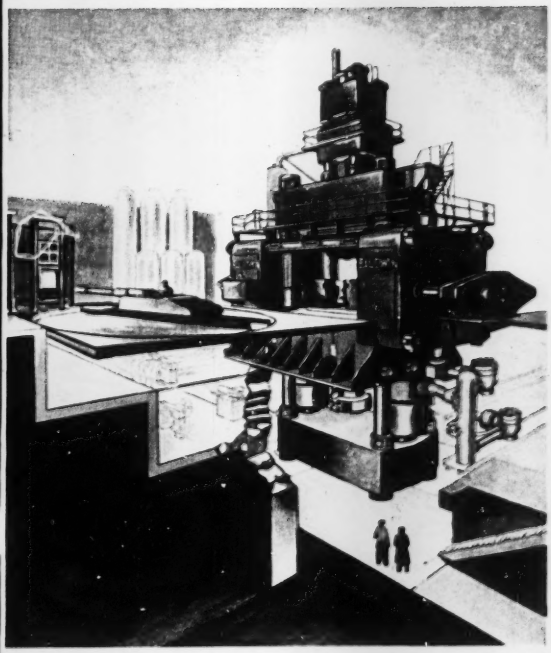

A NEW

ERA IN STEEL FORGING

BEGINS IN HOUSTON



Now installed at Cameron is a new multiple ram forging press, the largest of its kind ever constructed. Utilizing the Cameron Closed Die Extrusion Forging Process, this press brings to Industry a new era in steel forging. The total load on the main ram is 11,000 tons, on each side ram 6,000 tons, and on the top piercing ram 3,000 tons. The total weight of the press is 3,100,000 pounds. The press forgings produced approach for the first time the broad field of intricate shapes that have been limited heretofore to steel castings. This process opens the door to a great many design features which will result in improved quality at a lower cost.

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STEEL
October 26, 1953

Metalworking Outlook

Better than Expected

The fourth-quarter business decline isn't turning out to be nearly as severe as many economists predicted. Total metalworking sales should exceed $121 billion for 1953, an all-time record compared with $112.2 billion in 1952 and $100.3 billion in 1951. Manufacturers' cash dividends, though, don't parallel the increase. For the first nine months of this year they paid out $3235 million, only 1.5 per cent more than the $3185 million in the same 1952 period. The explanation: More profits were plowed back into business. Demand for capital funds by corporations amounted to about $13 billion in the first half, up $3 billion from the comparable 1952 period.

For the Guaranteed Wage

The big drums are beginning to be pounded by unions for the guaranteed annual wage. The United Steelworkers of America-CIO got in the first licks last week when its wage policy committee met in New York. Late next month, when the entire CIO holds its annual powwow, the subject will get further airing. And early in December the CIO's United Auto Workers will push the idea in Washington. The steelworkers, who admit they don't expect to win a full GAW in 1954, will propose next spring that a GAW trust fund be established on the basis of 10-cents-an-hour payments by the company, with the employer's liability limited to the amount in the trust fund.

Scrap Export: Good or Bad?

The liberalization of controls on scrap exports will probably have the greatest effect on the West Coast. Some scrap users there are protesting the action because it's causing prices to firm. The government move, which is for the fourth quarter only, is an experiment. The results will be studied to determine if greater liberalization is possible. Export licenses will be granted only if the seller has a firm order, will be valid only until Feb. 28, 1954, and in general won't be extended.

Get Rid of That Paperwork

Only 25 per cent of business records now taking up expensive office space need to be kept there. So says Robert A. Shiff, executive director of National Records Management Council, who believes that more than half of all business records could be sold as waste paper and another 20 per cent could be transferred to low-cost storage. He points out that there's now one clerical employee for every 2.5 production workers in the U. S. If you can get rid of 300 filing cabinets, the savings can approximate $47,000, he claims.

New Push for Dispersion?

Watch for Office of Defense Mobilization to tighten up on new plant construction in prime target areas for Russian bombs. Since 1951, ODM has had such a policy, which involves special study of projects costing $1 mil-

The Technical Outlook p. 113 The Market Outlook p. 167

lion or more to be built within 10 miles of a target area, but it hasn't meant much.

Chemistry of the South

The South will gain leadership within ten years in the manufacture of chemicals, predicts Dr. Frank J. Soday, director of research for Chemstrand Corp., which has southern plants. The South is now producing more than 25 per cent of the nation's chemicals, he says, and will be producing more than 50 per cent within the next decade. The shift holds significance for that portion of metalworking which makes equipment for chemical companies.

Uncle Sam: Competitor

The government is now in more than 100 activities which compete directly with industry. The U. S. makes ships, guns, ammunition, magnesium, aluminum, electrical fittings, acetylene, oxygen, electric power and many other commodities. It does metal heat treating, competes with private transportation facilities, does many types of engineering, research and development work and is engaged in all kinds of construction. Look for the House Government Operations Subcommittee to recommend governmental withdrawal from some of those activities.

Turbine Research in Detroit

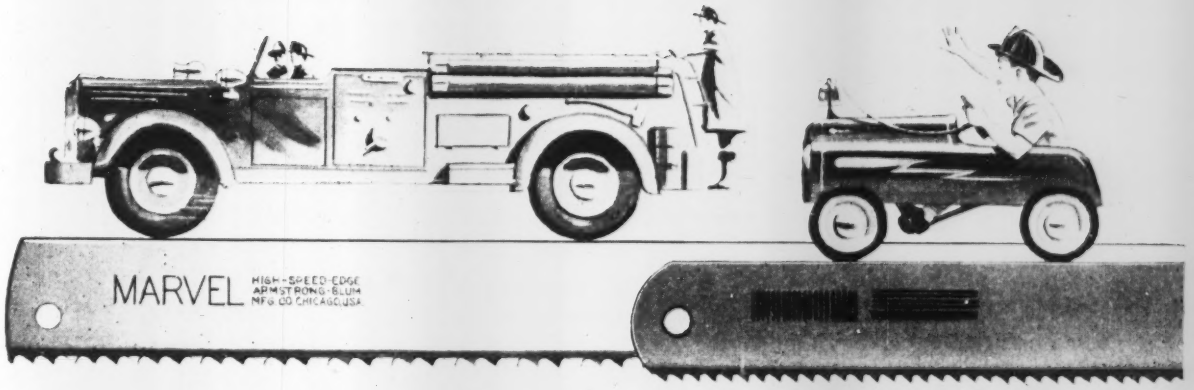
Turbine research in the automotive field is advancing more rapidly than many had expected. Ford, Chrysler and General Motors have been at it for some time, but the grapevine now reports that GM has a turbine-powered car it has actually been trying out on the proving ground. Preliminary tests reportedly indicate a lot more development is still needed, but fast progress can be expected.

Straws in the Wind

Chairman Charles A. Wolverton (Rep., N. J.) of the House Commerce Committee says the Federal Communications Commission should give an immediate go-ahead for color television . . . North American Aviation Inc. rolled off its assembly line its first production model of the F-100 Super Sabre . . . General Motors on Oct. 19 completed its first Hydra-Matic transmission since the Livonia fire; production is at the GM plant at Riopelle street in Detroit . . . Chrysler Corp. plans to expand car production facilities at its Los Angeles plant . . . The last remaining NPA-BDSA restriction on the use of columbium and columbium-tantalum for civilian goods will be removed Nov. 1.

This Week in Metalworking

At the metal show the emphasis was on selling, selling, selling (p. 71) . . . American Standards Association has developed the first basic standards to reduce industrial noise (p. 73) . . . A survey by the American Society of Tool Engineers shows that 28 per cent of industrial equipment is obsolete or inadequate (p. 74) . . . Largely because of the boom in the use of air tools, compressor sales for 1953 will be excellent (p. 75) . . . The coming competitive era will provide the acid test to the counsel given in the past by the nation's 15,000 to 20,000 management consultants (p. 76).



. . . *but*
Experience Cannot be Copied

More than a quarter-century ago MARVEL invented and basically patented the MARVEL High-Speed-Edge Hack Saw Blade—the UNBREAKABLE blade that increased hack sawing efficiency many-fold.

Every MARVEL Hack Saw Blade ever sold has been of that basic welded high-speed-edge construction, with constant improvements from year to year, as EXPERIENCE augmented the "know-how" . . .

MARVEL is not "tied" to any single source of steel supply, and has always used the best high speed steels that became available from time to time as metallurgy progressed. When-as-and-if finer steels are developed—and are proven commercially practical for welded-edge hack saw blades—MARVEL will use them, regardless of cost or source . . .

There is only one genuine MARVEL High-Speed-Edge! All other "composite" or "welded-edge" hack saw blades are merely flattering attempts to imitate—without the "know-how" of MARVEL EXPERIENCE . . .

Insist upon *genuine* MARVEL High-Speed-Edge when buying hack saw blades—and be SAFE, for you can depend upon MARVEL. They have been "tested", "pre-tested", and "re-tested" by thousands of users for more than a quarter-century!

MARVEL *Metal Cutting* SAWS

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"THANKS... WE'LL TAKE CARE OF IT FOR YOU"

Listen in on Reliance sales people talking . . . on the telephone or across a customer's desk . . . you won't find a "Johnny One-Note" among them. But you are apt to hear them repeat one expression more regularly than others. This is, "Thanks . . . we'll take care of it for you."

Put us to the test and you'll find this expression to be more than a habit of speech. It's a way of doing business at Reliance. That's not implying that we're "nine day wonders." We're not. But when you hear us say, "we'll take care of it," you can be sure we'll put every honest effort behind it.

Try us the next time you need *job-fitted* warehouse sheet or strip. If we can help you, we will "take care of it" for you. And that holds true whether steel is scarce or plentiful.

Dependable Dan, our official "Care-Taker" says it's all in the Reliance Job-Fitting Idea:

DEPENDABLE DAN

. . . knowing our "stuff" . . . our "feel for steel."

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Coke • Coal Chemicals • Pig Iron • Ingots
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Agency for Peace

Last week thousands of persons identified with the metalworking industry spent considerable time viewing exhibits and listening to technical discussions at the 35th National Metal Congress and Exposition in Cleveland. Practically every visitor pronounced it a great affair probably the best ever.

However, one wonders what would be the composite answer of all of the visitors to the question "What was the most significant feature of the 35th annual show and congress?" We believe that many would agree that the major significance was that what one saw and heard in Cleveland last week reflects a pace of technological progress far more rapid than the world has ever witnessed before. In some lines of scientific development we are making more progress in a year or two than previously had been made in a decade.

Naturally the question arises as to what exteni this accelerated pace of technological progress can be made to contribute importantly to the well being of substantial numbers of the people of the world. Certainly the evidence to date indicates that there is a wide difference in the degree to which such progress benefits mankind.

In the United States and in some other industrial nations, marked improvement in metallurgy, electronics and related fields usually leads more or less quickly to an upward surge in the standard of living of the people in those nations. At the same time an equal degree of improvement in these technical fields in the Soviet Union and some of its satellites to date has led to little, if any, improvement in the standard of living of their people.

The chief reason for the difference, of course, is that in the United States we assume that our economy is strong enough to support butter as well as guns whereas the Soviets still feel that every advantage gained from technological advancement must be utilized to increase the power of the state rather than to improve the welfare of the people.

Recent indications that the Kremlin recognizes the real necessity of doing more for the masses are significant. Technological progress could and should be the world's most effective agency for peace.

E. C. Shaner

EDITOR IN CHIEF

WATER FOR INDUSTRY: Lack of rainfall has caused a severe shortage of water in many areas throughout the nation. While thus far the situation has not caused as much trouble for industrial plants as on several previous occasions, the present low level of water is

a problem of vital concern to industrial executives.

At the recent meeting of the Association of Iron & Steel Engineers, Ross Nebolsine, president of Hydrotechnic Corp., estimated that when the American steel industry is producing from 80 million to 85 million tons of finished steel annually (p. 131), its plants are pumping about 9 million gallons of water daily. This is about 10 per cent of total industrial water requirements. Capital cost of water supply installations represents about 3 per cent of the total cost of an integrated steel mill. Total operating charges are estimated at about 1 per cent of the cost of making finished steel.

Most likely, adequate water supply will be a problem of increasing importance in the future.

* * *

MORE ELECTRIC STEEL: Another highlight of the annual meeting of the Association of Iron & Steel Engineers was the statement made by Willard C. Wheeler, management consultant (p. 120), that if the rate of increase in the production of carbon steel ingots during the past 34 years is projected into the future, by the year 1975 the United States will be turning out about 162 million tons, which is an increase of about 84 per cent over current output. Mr. Wheeler predicts that 43 million tons of the 162 million tons of carbon steel ingots or 30 per cent will be produced in electric furnaces.

This is not an unreasonable prediction. There is a definite swing toward greater output of electric furnace carbon steel. There is also considerable opportunity for marked improvement in electric steelmaking technique. Higher power, larger electrodes and much more efficient materials handling are just around the corner.

* * *

28 PER CENT OBSOLETE: A survey conducted by the enterprising American Society of Tool Engineers (p. 74) shows that on the average about 28 per cent of American production equipment and manufacturing processes is either obsolete or inadequate.

An interesting feature of returns from the survey is variation in obsolescence in plants of different size. For instance, the highest percentage of obsolescence was that of 42 per cent for grinding and finishing equipment reported by the largest plants (employing over 5000 persons). On the other hand, a high degree of obsolescence namely 38 per cent in production welding equipment is reported by small plants (employing fewer than 250 persons). In machining equipment the largest plants report an obsolescence of 41 per cent and the small plants 28 per cent. On materials handling equipment the largest plants admit 30 per cent obsolescence, and the small plants list 33 per cent.

Careful analysis of the ASTE figures might prove profitable for equipment and machinery manufacturers.

* * *

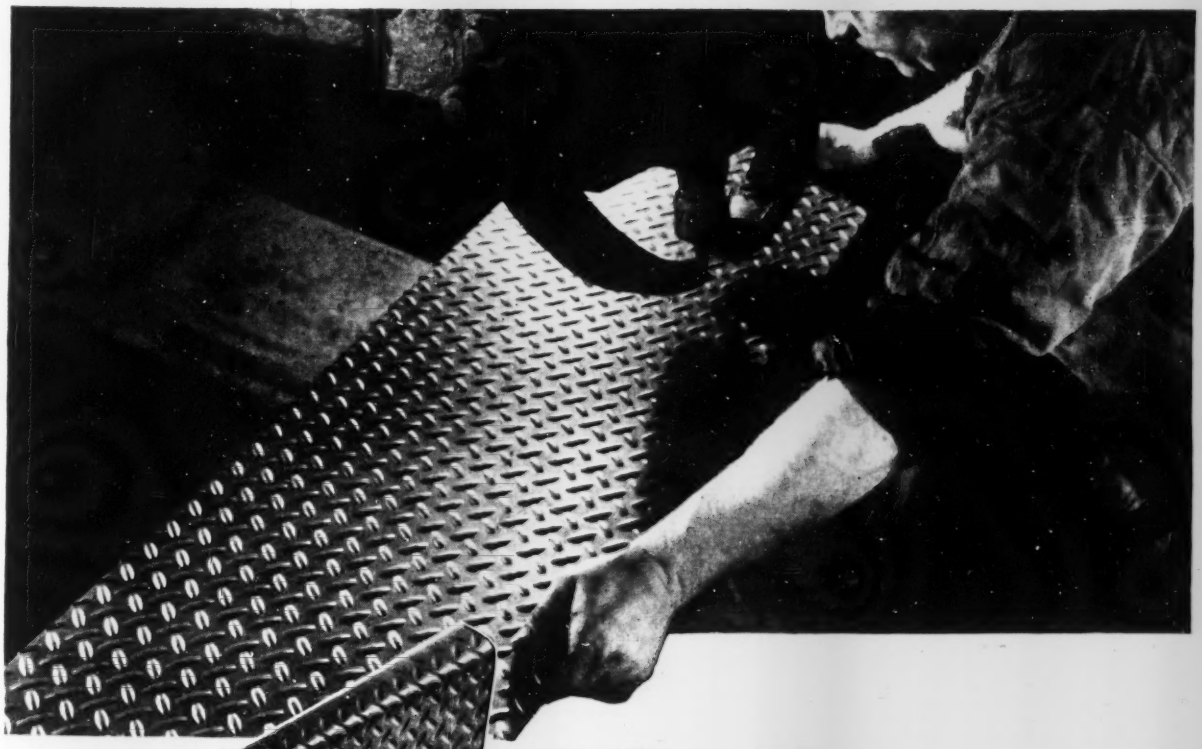
OUR IMPORTS INCREASE: Preliminary figures for the first eight months of this year indicate that there is at least a gambling chance that 1953 will witness a new record for imports into the United States. The previous high mark was $10,967,000,000 set in 1951. Preliminary figures for eight months of 1953 show imports of $7,387,500,000. The monthly average has been running at about $940 million. If continued during the last four months (p. 81) the year's total would exceed $11 billion. Expected heavy imports for the Christmas trade could easily push total imports above this figure.

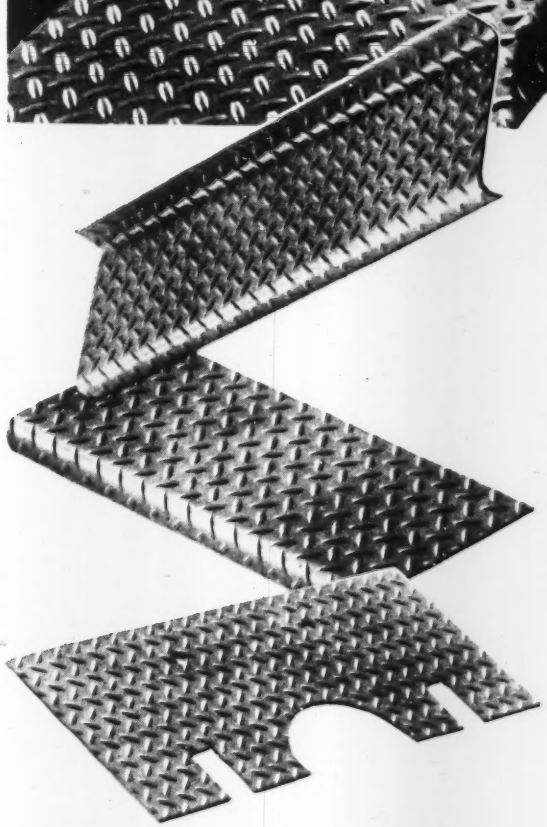
The increase in imports and consequent marked lowering of the excess of exports over imports cannot help but influence the thinking of the President's commission of advisers on foreign trade policy, which is chairmanned by Inland Steel Co.'s Clarence B. Randall.

* * *

REMARKABLE RECOVERY: Shortly after the transmission plant of General Motors at Livonia, Mich., was destroyed by fire on Aug. 12, executives announced that they hoped to be able to get back into production on a substantial basis some time in October. Considering the size and complexity of the job that confronted GM engineers and operating men, this hope of restoring operations at such an early date seemed to be rather optimistic.

However, GM has made good its prediction. Last Wednesday President Harlow H. Curtice announced that the first transmission units started rolling off the new assembly lines on Monday, Oct. 19. Output is expected to be stepped up to 1200 units daily within a short time. Restoring assembly line production of transmission units so quickly is an achievement in which General Motors and thousands of its suppliers can take great pride.





Safety Plate... Quick Delivery

The Famous Inland 4-Way Design

The next time you're looking for an answer to an under-foot problem where sure traction, easy maintenance and long wear are important, call Ryerson for Inland 4-Way Safety Plate.

The lugs in this attractive Inland pattern are hot rolled at right angles to each other to provide safe footing in all directions. There are no pockets where liquid or dirt can collect, so the surface is easy to drain and sweep.

This firesafe, long-lasting plate is available in two pattern sizes and a wide range of thicknesses. You can order it sheared, bent or punched to your specifications. Our stocks are complete—and we can assure you of immediate shipment.

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

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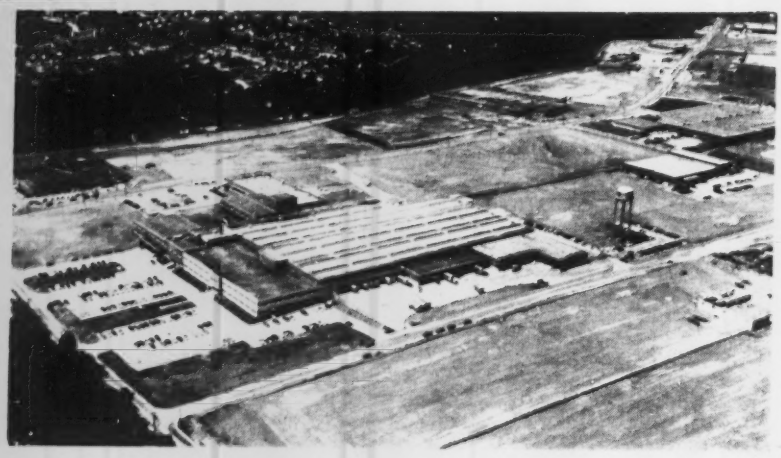
Trainloads of groceries for distribution in South



When Colonial Stores, largest chain of super markets in the South, decided to establish a new and larger warehouse in Atlanta, Ingalls was selected to fabricate the steel for it. More than 1300 tons went into this distribution nerve center, which will serve 348 stores in seven Southern states.

Why don't you let Ingalls, the nation's largest independent fabricator of steel, quote you on your next steel structure?

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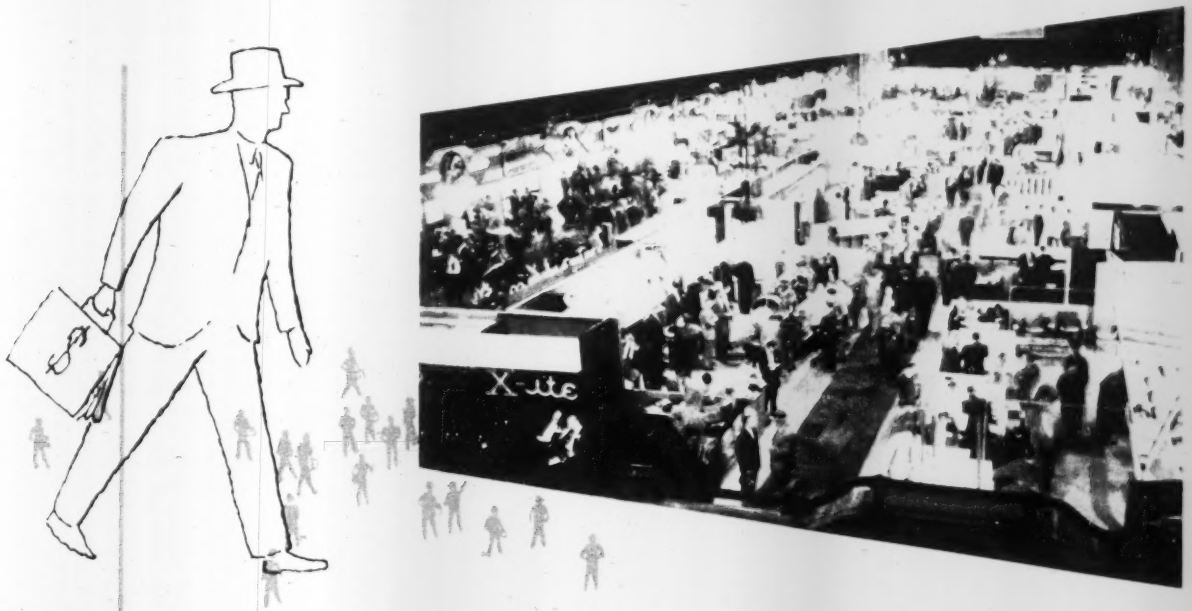

More Sell at the Show

Easy chair and ice water theories of salesmanship are knocked for cocked hat at Cleveland's 35th National Metal Exposition. Era of give-and-take competition previewed

A HUSTLING supersalesman who said he couldn't get space inside Cleveland's massive Public Auditorium at the 35th National Metal show last week displayed his merchandise in the street.

Dubbed exhibitor No. 462½ by show officials, he parked his trailer outside the auditorium and operated from there. Only fee involved was the nickel he put into a parking meter each hour.

This combination of shrewdness and enterprise keynoted the entire exposition. After a lapse of more years than old timers care to admit, they were selling on the inside, too.

Times Have Changed — On the inside, an estimated 50,000 showgoers saw fewer pretty girls, fewer easy chair and ice water exhibits. Gimmicks gave way to equipment and products that could be demonstrated and sold on the spot.

To even the casual observer, there was only one conclusion to be drawn: Rusty selling muscles were being limbered up for a new era of competition.

Down to Business — Bustling tempo of the show was characterized by a sales representative who glanced nervously at a substantial list of contacts and commented upon the man who was in the public phone booth he was waiting to occupy: "What's he doing in there . . . talking to his wife?"

Realistic business was the order of the week. A nonferrous exhibitor said he made 20 important contacts by noon of the first day of the show.

Another got double duty out of his equipment by using it as an operating display as it was turning out work on a current subcontract.

A manufacturer of cleaning compounds processed brazed parts being fabricated by a neighbor. "The favor works both ways," he explained. "We get a chance to show off our cleaner under actual operating conditions, while our friend can give a potential customer a look-see at a finished product."

Economic Climate — Tangible evidence of what metalworking men see in the cards for the days ahead was offered by the kind of exhibits they brought to the show. In many instances, they counted on the hunch that now is the time for the reassessment of processes and products.

Testing and inspection, for example, were once regarded as noth-

NEW OFFICERS

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Vice president: George A. Roberts, Vanadium-Alloys Steel Co.

American Welding Society

President: F. L. Plummer, Hammond Iron Works

1st Vice president: J. H. Humberstone, Ohio Chemical & Surgical Equipment Co., Air Reduction Co. Inc.

2nd Vice president: J. J. Chyle, A. O. Smith Corp.

Society for Nondestructive Testing Inc.

President: Gerold H. Tenney, Los Alamos Scientific Laboratories

Vice president: William C. Hitt, Douglas Aircraft Co. Inc.

ing more than a necessary evil. Last week at the show quality control was given a prominence that was aptly borne out by a state of mind expressed on the cover of a brochure: "One test is worth a thousand expert opinions."

Manufacturers realize more and more that the sooner they can inspect the less investment they have in rejects. Result: Inspecting and testing methods are being engineered into production line operations.

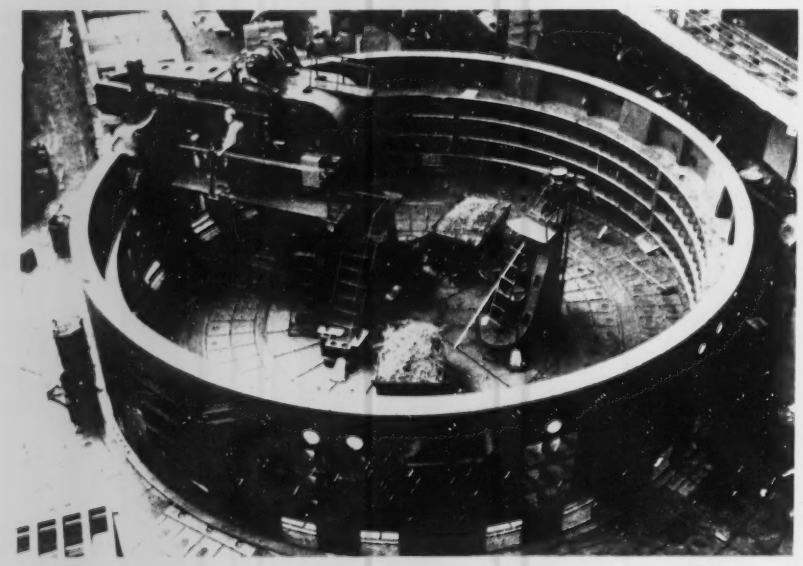
Fast Finishes—Many cars were bent in surface treatment booths. Reason: Manufacturers will pay closer attention to the durability of finishes on their products in the coming hassle for the consumer's nod.

Others—Heat treating, the old reliable, featured new and specialized methods for meeting requirements imposed by specifications and price sniping.

New Carbide Announced

Heavy-duty steel-cutting grade cemented carbide that steps up machining operations as much as 30 per cent was announced by Carboloy Department, General Electric Co., Detroit, at the National Metal Congress & Exposition in Cleveland.

Capable of removing more cubic inches of steel per minute while providing up to 50 per cent longer tool life than existing grades the new grade 370 cemented carbide was developed for heavy cuts at high tool temperatures. It is the first grade in a new carbide series.



Round and Round It Goes

A stator frame for one of 12 hydraulic turbine driven generators being made by General Electric Co., Schenectady, N. Y., is shown on a 60-foot vertical boring mill. The generators, rated at 73,684 kilovolt-amperes, are for McNary Dam on the Columbia river. Each of them, when assembled, will weigh 2.5 million pounds and will require between 35 and 40 railroad cars to transport it to the dam site

Atoms in Industry

RCA official predicts great power and automation strides in next 20 years

AUTOMATIC FACTORIES, control of gravity, atomic electric plants and atomic-powered airplanes and ships—all are possible developments within the next 10 to 20 years, Arthur Van Dyck told the Society of Industrial Designers at its annual meeting last week in Bedford, Pa.

Technical director of Radio Corp. of America, Mr. Van Dyck related that the Atomic Energy Commission is the third largest business operation in the nation today, and at its present growth rate it will be the largest within five years. Here are some of the contributions he said atomic science should provide within our lifetime:

Electric Potential — 1. Atomic fuel will be used to generate electric power, and totally new applications for power will result. But he does not believe that these plants will replace current electric facilities; rather, power will be available to areas where power is not possible today.

2. Atomic fuel will power long-range transportation units, especially ships and aircraft. Already the first atom-powered submarine to be launched in 1954 has been announced. Small-size engines will also be developed.

No Limits—3. New materials will be invented and characteristics of old ones improved. More startling discoveries will be made in medicine, biology, nutrition, food preparation and life processes.

4. Many industrial processes will be improved and new ones introduced. Contamination and leak detection, continuous measurement and automatic thickness control are examples already in use.

Mechanized Thinking—Electronic devices, such as the calculating machines for office work, are already providing a considerable degree of automation, Mr. Van Dyck pointed out. Future electronic and atomic devices will introduce automatic operation in many high-production industries.

Even though there will be a few

outstanding developments from atomic science, Mr. Van Dyck predicted that the greatest influence will come from improvements and new possibilities in existing branches of engineering and manufacture.

Steel Containers Bounce Back

More heavy and light steel drums are being fabricated of stainless steel, notably for interplant shipments where returnable factor is controlled by the shipper. Although first costs are substantially higher, stainless drums are proving more economical. Such was the consensus at the fall meeting of Steel Shipping Container Institute, New York.

Research in the development of linings for steel containers is paying off in the miscellaneous field. Also with more steel available steel containers are steadily regaining losses to fibre containers.

Steel drum production will increase approximately 5 per cent this year over 1952. Lower inventories were general with producers at midyear, but more steel is bringing stocks nearer balance.

First-Quarter Allotments Drop

Allotments of steel, copper and aluminum for "A" products for direct defense and atomic energy needs during first quarter, 1954, show an average drop of 20 per cent from fourth-quarter, 1953, allotments.

Steel allotments for first quarter, 1954, are down 20 per cent from fourth quarter, 1953, or 1,466,840 tons compared with 1,837,803 tons; copper and copper base alloy products allotments are 23 per cent lower, or 167,316,000 pounds compared with 217,397,000 pounds; aluminum allotments are 18 per cent lower, or 167,707,000 pounds compared with 203,595,000 pounds.

The Office of Defense Mobilization warns that the allotments represent only the quantities necessary to cover "A" product production and reflect adjustments in military schedules. Total quantities of steel, copper and aluminum to be set aside at the mill level will include additional amounts for atomic energy or defense-related "B" products.

The Sound of Industry: Not So Welcome

American Standards Association study contains first basic data for solving noise problems. Other standardization questions raised at National Standardization Conference

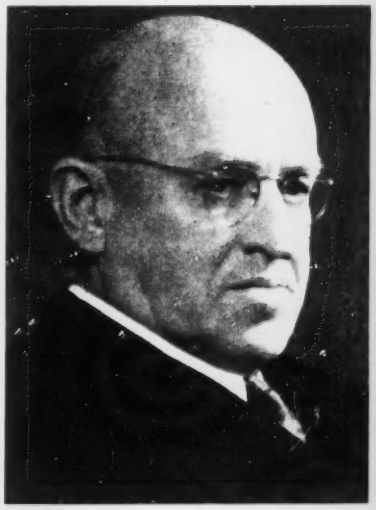
THE HUM of industry is sounding louder in management's ear as compensation awards mount for workers' deafness.

A giant step toward engineered noise control was taken last week as industry was presented with its first comprehensive working material for solving noise problems. Data on relation of hearing loss to noise exposure, presented at the fourth National Standardization Conference in New York, could be a major foundation stone for building standards for noise in industry. Findings of a year's study, to be published Nov. 15, will cover such subjects as continuous and intermittent exposure to steady noise, impulsive noise, riveting noise, jet engine noise and drop forging noise.

Language of the Future—Opening meeting of the conference marked the 35th anniversary of the American Standards Association. Roger E. Gay, president of ASA and Bristol Brass Corp., pleaded for a common industrial language, saying: "Predetermined standards of definition, dimension, performance, test and safety are a basic requirement for orderly transition into the new industrial era ahead." Vice Admiral George F. Hussey Jr., ASA managing director, reported that the federal government has asked ASA committees to review all federal specifications and make recommendations to bring and keep them in line with industrial standards.

From a nucleus of five engineering societies and three federal departments the organization has grown to a membership of 114 associations and 2337 companies directly supporting national standards. To date, ASA has approved 1350 American standards, including 160 American safety standards which affect virtually every industry and plant in the nation.

Award Winners—Top standards awards went to metalworking men. The Howard Coonley Medal was awarded to Sen. Ralph E. Flanders (Rep., Vt.), ex-president of Jones & Lamson Machine Co., for "serving the cause of voluntary standardization through practice and example and by writings and speeches." The Standards Metal was presented to Col. Perry L. Houser, International Harvester Co., for "leadership in actual development and application of standards."



SEN. RALPH E. FLANDERS
...awarded the Howard Coonley Medal

COL. PERRY L. HOUSER
. . . awarded the Standards Medal

Industrial Equipment 28% Obsolete

That's what a survey by American Society of Tool Engineers shows. The report also indicates that large plants appear to be in the greatest need for new machinery

CAPITAL EQUIPMENT MAKERS can look forward to a good replacement market for several years to come if industry does something about the obsolete equipment in its own plants.

In evaluating its position, industry admits that approximately 28 per cent of its production equipment and manufacturing processes are already obsolete or inadequate says American Society of Tool Engineers as the result of a survey.

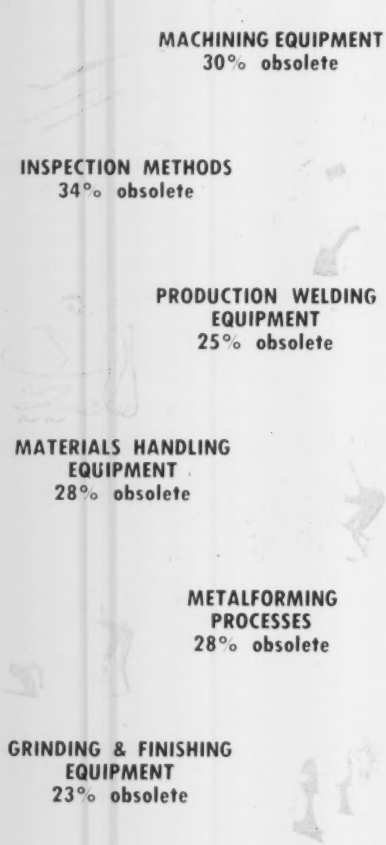
Concern — The organization, which has 27,000 members and 111 chapters throughout the country, says, "There can be no doubts of industry's deep concern over the threats posed by this obsolete equipment and processes in the stiff national and international competition which industry feels is ahead. There is today a growing awareness that new equipment with all modern accessories is the only answer."

For this reason, the association looks forward to an unusually good attendance at its exposition in Philadelphia next April.

Tabulation — The survey was broken down by plant size into small plants (less than 250 employees), intermediate (250-999), large (1000-4999) and very large (over 5000 employees). The results showed that the very large plants reported more accurate figures because of specialized departments to handle the tabulations. Small plants, mostly specialists also, had a good idea of their position, but the in-between companies were not so sure.

Even by breaking the accompanying figures into their component parts, the association was unable to tell which segment of industry is in the worst shape as far as over-all obsolete equipment is concerned. But the largest plants seem to be in most need.

Largest by Far—For instance, in machining equipment, they led with 41 per cent obsolescence. Small plants were second with 28 per cent. Those groups also led in the materials handling category, with small plants reporting 32 per cent of the equipment in need of replacement and largest plants reporting 30 per cent. Again, large companies reported that 32 per cent of their inspection and precision control equipment are inadequate, and small plants followed with 30 per cent.



Best position reported by the very large companies was in metalforming equipment, with only 15 per cent in need of replacement. But the smallest companies were high in this group at 33 per cent, followed by 24 per cent in the intermediate classification. The highest percentage of obsolescence reported was 42 for grinding and finishing equipment in the largest plants. But apparently the rest of metalworking is not too bad off, because the next figure is 25 per cent for both small and intermediate plants. Finally, small plants are most concerned about production welding equipment, reporting 38 per cent of that equipment as outmoded.

Pretty Picture—Add to that replacement market the expenditures anticipated for added new equipment within the next few years and you get one reason for continued optimism of capital machinery manufacturers.

Better Business Seen for 1954

Business in 1954 will be even better than in 1953.

That's according to a poll of industrial machinery and supplies distributors, taken at a joint regional meeting of the American Supply & Machinery Manufacturers' Association Inc. and the National Industrial Distributors' Association in Washington.

Of 20 distributors, only one foresees declining business in the first half of 1954 compared with 1953; 13 expect equal sales and six look for an increase, the expected gain averaging 17 per cent. In the second half, two predict a drop compared with 1953; nine see about equal business and nine expect higher sales, the increase averaging 15 per cent.

Of 59 manufacturers of industrial machinery and supplies who took part in the poll, 20 expect first half 1954 business to be about the same as 1953; 21 look for a drop, averaging 7 per cent, and 18 predict their volume will be up an expected average of 10 per cent. In the second half, 19 manufacturers foresee volume equal to current sales; 21 look for a drop averaging 11 per cent, while 19 expect an increase, averaging 10 per cent.

Youngstown's Earnings Go Up

Youngstown Sheet & Tube Co. reports that its third quarter earnings of over $8 million brings its earnings for the first nine months of the year to $23,001,897. Sales for the first nine months were over $422.5 million.

J. L. Mauthe, Youngstown president, states that his company has

spent $42 million this year in its expansion of the Indiana Harbor and Youngstown facilities. The estimated cost of completing authorized work at the two plants is another $32 million.

Company directors declared a cash dividend of 75 cents per common share, payable Dec. 15.

Republic Adds Rolling Mill

Republic Steel Corp. will increase rolling capacity of stainless steel by 1800 tons of finished products a month at its Massillon, O., plant, says C. M. White, president.

Planned for completion by mid-1955, new facilities will include a wide cold rolling mill for cold reducing stainless steel coils and a 26-inch two high skin (temper) mill. The cold rolling mill will be capable of rolling stainless steel strip up to 48-inches wide and down to a minimum thickness of 1 64-inch. Auxiliary equipment to be installed includes annealing and pickling lines, a combination single and multiple-strand cut-up line, resquaring shears, roll grinders, a scrap baler, scales and welding and materials handling equipment.

Soaking Pits in Operation

Pittsburgh Steel Co. says that six new soaking pit furnaces are now in operation at its Monessen, Pa., works. Part of a $3.5-million program to build 15 furnaces, this section brings to 12 the number of new furnaces currently in production.

Steel ingots charged into the furnaces by new 30-ton pit cranes vary from 6 to 16 tons. One furnace will hold 75 to 100 tons of ingots. These furnaces, of the center-fired recuperative type, were built by Amsler-Morton Corp., Pittsburgh.

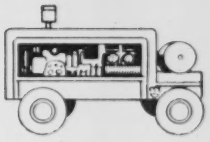
Western Shipyard Hopes Sink

San Francisco and other West Coast shipbuilders' hopes for new activity were sunk with the Navy's announcement that it will let its new ship contracts on a strictly competitive basis.

Officials say they will be unable to compete. Construction costs in the West are too high.

Air Compressors:

Sales boom under power of new air tool applications



THE AIR POWER revolution to the air compressor industry has nothing to do with jet or atomic airplanes; its revolution is the tremendous development of compressed-air powered tools which is blowing up compressor sales to record levels.

Sales in the air and gas compressor industry totaled $214-million last year, and the former accounted for the bigger slice. Most air compressor manufacturers report that 1953's volume will hit a new high. Estimates by individual companies of their anticipated increases over 1952 range from a low of 10 per cent to a high of 300 per cent given by Pittsburgh Gage & Supply Co., a distributor of equipment for several companies.

Combo for Success—Predictions for 1954 are equally optimistic. "We've just got a winning combination," commented one compressor maker. "We can get all the steel we want when we want it; industry in general looks good for 1954 and new applications for air-powered tools coming in almost daily assure us of continued market expansion."

Officials of the compressor section of the Westinghouse Air Brake Co., Pittsburgh, illustrate the market expansion well with their comments: "Before the war, filling stations bought 75 per cent of our tank-mounted compressors. That market now represents about 10 to 15 per cent of our volume because industrial applications are taking its place. Both metalworking and woodworking are turning to pneumatic tools."

What's New—Recent applications which have added new zest to the compressor industry are the use of air-powered grinders, drill presses, nut runners, chippers, overhead hoists and impacters. Air control and positioning devices for use on other equipment are also opening new avenues in the use of compressed air for industrial purposes.

Air tool proponents are pushing hard their sales of new applications on the basis that their equipment offers more power with less weight and smaller size, greater control sensitivity and more flexibility for production techniques.

Old Standbys — Keeping pace, too, in their demand for air compressors are the old standbys, including paint spraying companies, the farming industry with its call for insecticide and weed control spraying devices and the construction industry which is enjoying its own boom times. Leasing (see STEEL, Oct. 19, p. 45) is playing an important part in getting more compressors onto the market, particularly in the construction field, a midwest distributor reports.

Some companies, such as Davey Compressor Co., Kent, O., which has held to making a few types of compressors in recent years is anticipating a decline in defense orders and is expanding its lines to meet the growing industrial demands.

One Per Month—Officials of Ingersoll-Rand Co., New York, which not only produces air and gas compressors but several hundred air tool items, are among the most optimistic in the industry. "We're expecting more competition next year and are planning increased sales efforts. The most encouraging factor, however, is the development of new applications of air tools. We've brought out new air tool applications on the average of one a month for several years now; most have started from requests for specific labor-aiding devices from industry."

Overhead as well as other costs get more attention as . . .

Consultants Look to the Future

Today there are more consulting management engineers than ever before. Latest advice from these professional advice-givers: Watch business expenses as well as direct costs

CONSULTING management engineers are waiting expectantly to find out how impressive their advice to industry has been.

If the consultants have really made a point with industry men, this could be a period of tremendous growth for the professional advice-givers. On the other hand many consulting management engineers have never gone through a leveling-off period in business activity or a recession. So, this also could be a period when many one-man or shoe-string financed consultant firms disappear.

Misnomer—One thing certain to come out of the present business period is a change in name. Consulting management engineers may soon be called more accurately management consultants to differentiate them from consulting engineers who are an entirely different breed.

Consulting engineers are engineers in the true sense of the word. They are hired for their specific skills to work on a definite job or to help a firm or government agency over a bulge of work. The consultant may be an individual with an outstanding reputation in his field or a firm with anywhere from 6 to 500 employees; most have from 50 to 75. Best testimony to the growing use of consulting engineers is the increase in their number: With about 1000 firms in existence now, there are twice as many as there were ten years ago.

Different Problems—Any of the large management consultant firms include some of these true engineers on their staffs. But the management consultant is primarily concerned with management-level problems rather than the installation of a new air conditioning system or a new highway.

According to the Association of Consulting Management Engineers, New York, whose membership includes more than 40 of the top 50 companies in the field, the average management consultant firm has 35 to 40 employees; it does 85 per cent repeat business; it bills on some form of man-day basis. Some estimates put the number of consultant firms in the U. S. today at 15,000 compared with 2000 in 1940. But included in that estimate must be an overwhelming majority of one or two-man operations.

Underlying Causes — The consultants' fortes are their wide business background (they get into many plants, bring the practices of a lot of successful businesses to "a" business) and their objective viewpoint. Most start with a specialty (many began as consultants on wage incentive plans) and gradually broaden their scope into other fields as marketing, financing and personnel problems. Their aim, consultants themselves say, is not to cure the symptoms of business ills, but to find the major causes behind the symptoms.

By getting around to many plants, management consultants say they are generally a year or so ahead of industrial leadership in isolating the real remedies needed by industrial management. The record shows consultants were among the leaders of those promoting organized executive development, now a standard procedure in many firms. Management consultants were among the first to urge extensive market research studies just after World War II.

Now It's Expenses—Now, management consultants are talking about reducing business expenses (as opposed to cost reduction which refers to paring expenses on a particular product). "Industry has done a good job controlling direct labor costs through piece work, incentives and the like. But indirect costs have been forgotten. If industry is only going to do a partial job of cost control, it should start first on those indirect expenses of overhead," says one consultant.

Though they believe they have much to give industry, consultants aren't sure industry will be ready to give them a chance to serve in the face of dwindling sales. "In the past when companies needed us most," consultants point out, "they often wouldn't call on us but saved their pennies instead." Now consultants hope to change that old tendency because of their improved techniques for giving help and because of the education job they have accomplished with their clients concerning the value of "outside" aid.

Kelly Committee Reports

Suggests several ways to return National Bureau of Standards to original work

RETURN the National Bureau of Standards to its original objectives and make it possible to improve the quality of its work. That sums up the report of the Scientists' Committee for Evaluation to Secretary of Commerce Sinclair Weeks, and the committee made several concrete recommendations to accomplish those aims.

The Kelly Committee, as it is known because of its chairman, Dr. Mervin J. Kelly, head of Bell Telephone Laboratories, was emphatic earlier in the year about transferring weaponry projects to the Defense department (see STEEL, Aug. 31, p. 36). That step was made effective Sept. 27 and is now nearly complete. Since 1950, when weapons development started to take so much of the bureau's time, it has lost much ground in its basic research program. The committee believes NBS should try to regain that lost ground within the next two fiscal years and then expand its work.

Hopeful—Secretary Weeks said, "In our consideration of the budget of the National Bureau of Standards for the coming fiscal year, we are taking full account of the committee's recommendations."

Those recommendations include modernization of facilities and increased space for the basic programs; improvement of internal organization to relieve the director, Dr. Allen V. Astin, of some of the overburden of recent years; greater use of the bureau's services by all branches of government, including the Department of Defense and the Atomic Energy Commission, for nonweaponry scientific and technical aid; decrease in repetitive test operations; division of primary responsibility for policy and procedure on commercial product tests between the secretary of commerce and the director of the bureau; increased support of standard samples programs; and advisory groups to the director appointed from membership in scientific and technical societies.

Prelude to Color TV

Anticipating early Federal Trade Commission approval of color TV, John Volkert Metal Stampings Inc., Queens Village, Long Island, N. Y., is already making parts for the complex receivers. Jack Kleinoder, general manager, holds a tricolor mount which is the heart of a color television tube

New Bureau Organizes

Newest bureau of the Commerce department is the Bureau of Foreign Commerce headed by Loring K. Macy. The three major offices of the new bureau will be Export Supply, Economic Affairs and Intelligence & Services.

The bureau will take over the functions of the former Office of International Trade of which Mr. Macy was also director. Officials promise increased attention to the promotion of private foreign investment and close co-operation with the Business & Defense Services Administration.

Winchester Expansion Planned

Four metalworking companies received certificates of necessity for accelerated tax amortization on projects over $1 million from the Office of Defense Mobilization from Sept. 24 to Oct. 7. In that period ODM granted 54 certificates for facilities amounting to $49.3 million.

Winchester Repeating Arms Co., Division of Olin Industries Inc., New Haven, Conn., won the largest metalworking certificate amounting to $2.4 million for expansion of its ordnance facilities, 55 per cent fast amortization allowed. Stanley Works, New Britain, Conn., received a certificate for a $1.9-million expansion of its steel finishing facilities, 50 per cent amortization allowed. Allis-Chalmers Mfg. Co. got a certificate for a $1.5-million switchgear project at Terre Haute, Ind., 50 per cent allowed. Quaker State Metals Co., Lancaster, Pa., won a $1.2-million certificate, 50 per cent amortization, for wide aluminum sheet facilities.

GE Proposes Atomic Power Plant

General Electric Co.'s president, Ralph J. Cordiner, has proposed to the Atomic Energy Commission that GE proceed at once on the development and design of an atomic power plant.

The proposed plant would have the dual purpose of producing large quantities of plutonium and electric power at the Hanford plant which GE now operates in Richland, Wash. The Hanford plant produced the first plutonium for the atomic bomb.

Exact amount of power that could be produced is classified, Mr. Cordiner states, but it would be "far beyond" the needs of the Hanford plant and would be available to the power-short Northwest. Estimates of the additional power required each year to keep pace with that area's needs have run as high as 400,000 kilowatts.

GE officials state that the proposed plant can be built and placed into operation within 5 years.

GE Sales Zoom to New High

General Electric Co.'s sales totaling over $2.3 billion for the first nine months of 1953 hit a new record in the company's history, Ralph J. Cordiner, president, announces. Earnings for the period, up 23 per cent over the same 1952 period, amounted to $116 million, equal to $4.03 per share of common stock.

Commenting upon his company's record, Mr. Cordiner said that he sees "nothing in the picture to justify fears of a recession and that there is no reason why consumer durables cannot continue to maintain a good volume with proper selling effort at all levels."

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Federal Trade Commission Chairman E. F. Howrey is cleaning the cobwebs out of competition-controlling machinery. Small business complaints are to get quicker hearings

IMPLEMENTING competition is one of the prime objectives of current activity in the Federal Trade Commission.

For example, prompt attention to businessmen's complaints of unfair competitive practices is to be assured through a separate Small Business Division, in the process of development at FTC. Many businessmen had been telling FTC Chairman Edward F. Howrey that when they submit their complaints they never hear anything until and unless a formal complaint is issued. One of the duties of the Small Business Division will be to keep small companies informed; another will be to expedite their matters through the commission.

Another Move—Also, announcement is expected momentarily of the full membership of the Advisory Committee on Cost Justification. H. F. Taggart, assistant dean, University of Michigan School of Business Administration, recently was appointed chairman. Purpose in setting up this group is to develop yardsticks for obtaining wider compliance with the Robinson-Patman Act.

"Although savings in cost constitute the primary justification for lawful price differentials under the act," explained Chairman Howrey, "there has been little advancement in the field of distribution cost accounting during the 17 years it has been on the books. Business firms have found it very difficult, if not impossible, to determine what cost savings are allowable and how they may be proved. The few distribution cost studies that have been developed have been very expensive and have involved detailed analyses of the seller's business.

Ability to Compete—"These difficulties have engendered widespread disregard of the prohibitions against price discrimination. This is so because sellers cannot, in our competitive economy, rely on a one-price policy. In order to compete they must be able, where the occasion requires it, to pass on to the buyer the actual savings created by the buyer's method of doing business.

"It is our hope that this advisory committee will be able to ascertain whether it is feasible for the commission to formulate standards of proof and procedures for costing which can be adopted by the commission as guides to business enterprises desirous of complying with this important statute. . . . It is recognized that no cost accounting system can give instantaneous Robinson-Patman Act answers, but in my opinion there is no necessary conflict between better costs for commission purposes and more useful costs for management."

FTC Reverse — Chairman Howrey has recommended that the commission should not seek nullification of the McGuire Act which exempts from the operation of the federal antitrust laws vertical resale price maintenance contracts which are legal under state fair trade acts. This is a reversal of the commission's attitude when it was controlled by Truman appointees. Not only does the McGuire Act have the strong support of small business, but it was passed by overwhelming votes in Congress.

In still another move, Robert Heller & Associates, Cleveland, have begun their survey of procedure in the Federal Trade Commission. Object is to promote efficiency by eliminating needless paper and other work.

Trend in Public Housing . . .

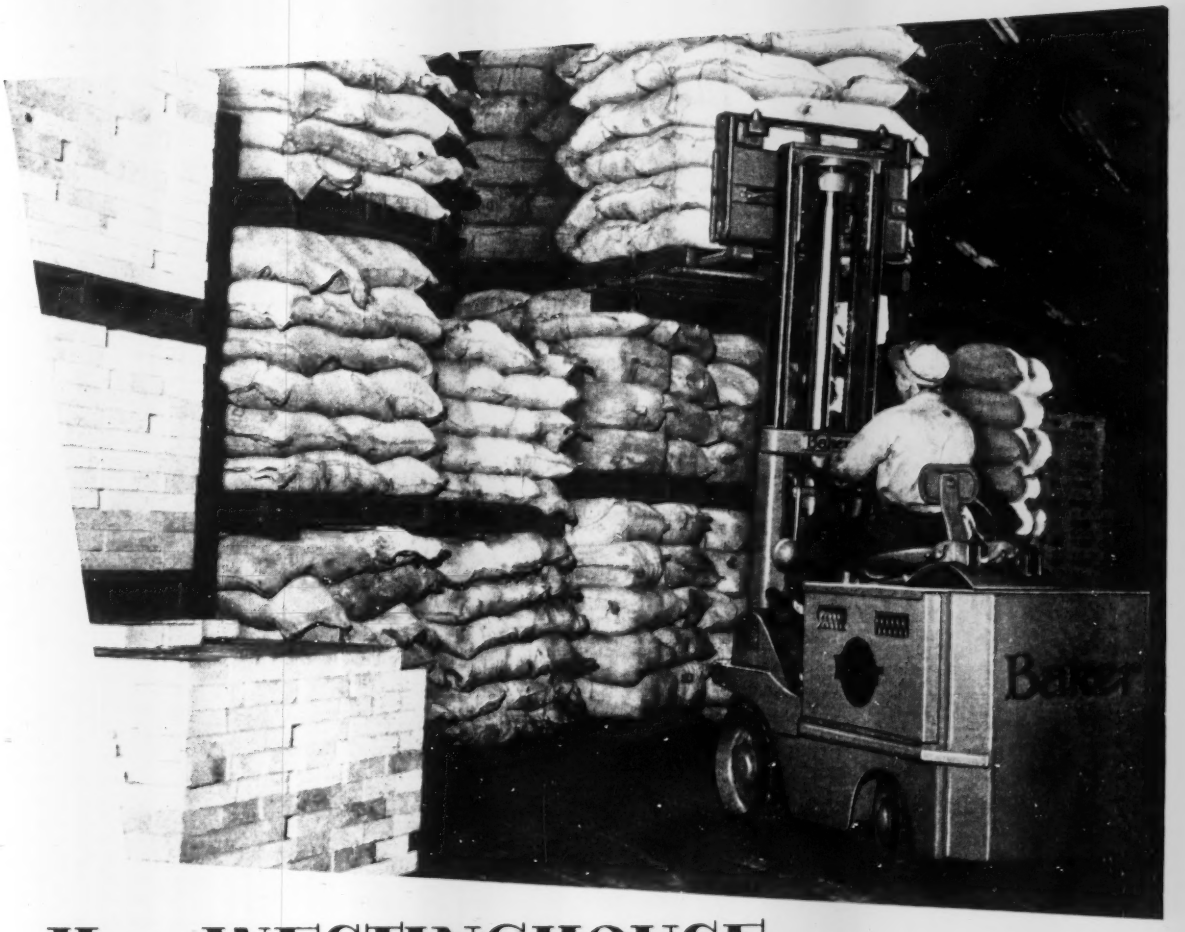
Will 1954 bring a dead end for the 16-year-old public housing program? Proponents fear it will if Congress continues the trend of the last three years of authorizing fewer and fewer annual construction starts on new public housing units.

The 20,000-unit ceiling set by Congress this year for fiscal 1954 represents the lowest number approved since 1949 when the postwar public housing program got under way with an authorization of 135,000 units. Congress directed former Rep. Albert M. Cole (Rep., Kan.), now head of the Housing & Home Finance Agency, to conduct a study and submit recommendations to Congress before Feb. 1, 1954. A report also will be due at that time from the 21-member Advisory Committee on Government Housing Policies & Programs appointed by President Eisenhower with Mr. Cole as chairman.

On the basis of past views expressed by Mr. Cole and the known opposition of many members of the advisory committee to the public housing program, it is expected the recommendation of the committee, and of Mr. Cole as HHFA head, will call for an end to the program.

Heads BDSA Division

Kenneth J. Burns, manager of sheet and strip sales at Inland Steel Co., Chicago, has been appointed head of the Iron & Steel Division of Business & Defense Services Administration



How WESTINGHOUSE *saves $37,000 yearly* at its Trafford, Pa. Foundry

■ This plant formerly loaded and unloaded bagged material, handled barrels and stored patterns by manual methods. Today fork trucks have mechanized all these operations. Result: *an annual saving of $37,000.*

In the warehouse, for example, the fork trucks now stack materials on pallets—right up to the rafters. Indirect benefits: space saving, fewer accidents, less material damage. Direct benefits: substantial savings in labor costs.

Fork-truck handling and tiering of patterns eliminated back-breaking work, increased storage capacity 500% and made additional labor savings.

Unloading bagged material (wood flour, sea coal, mogal, pich, etc.) and fire brick (formerly manhandled one at a time) is now done in palletized unit loads—another big cost saver. And still more money is saved by handling barrels with a Baker 4-Purpose Carriage truck and drum shoes.

write for *6-page special report on the application of Baker attachments to various loads.*

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Baker
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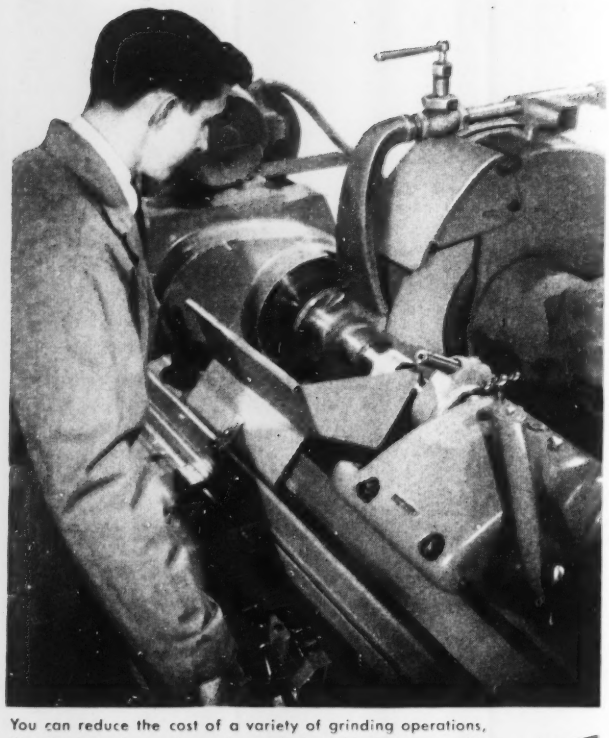
BAKER-LULL Corporation, *Subsidiary*, Minneapolis, Minn.
Material Handling and Construction Equipment.

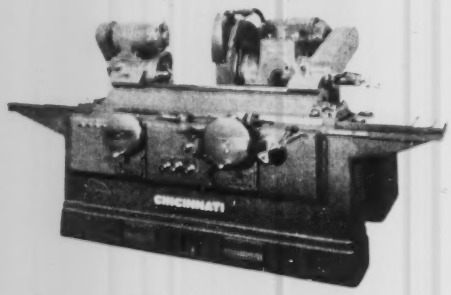
There's No Time Like the Present

To Replace Your Worn-Out Plain Grinders



You can reduce the cost of a variety of grinding operations, like the one shown above, by replacing old equipment with new CINCINNATI FILMATIC Plain Hydraulic Grinders.

Proper timing spells success in farming, driving a golf ball, making an investment. Proper timing in replacing shop equipment is whenever your replacement program indicates that old machines or methods should be discarded. ¶In the field of precision centertype grinding, machines that no longer earn their keep should be replaced now, and your best replacement bet is CINCINNATI FILMATICS. For example, consider the medium-sized group, 6", 10"-L, 10" and 14"-L. There are many reasons why these machines should be your first choice:



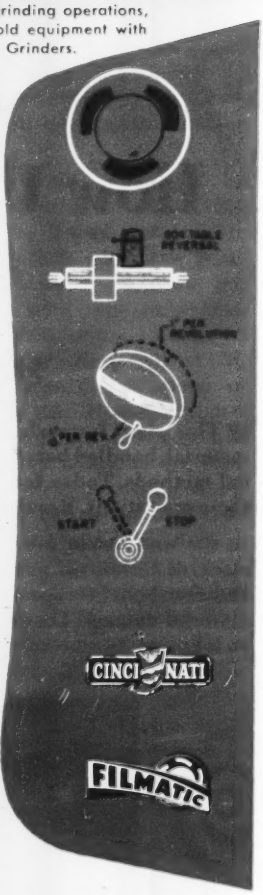
CINCINNATI FILMATIC No. 10"-L Plain Hydraulic Grinding Machine. Catalogs No. G-566-2 and No. G-603 contain complete data on the medium-sized group. Write for copies.

a. Grinding wheel spindle bearings are FILMATICS. They are dependable . . . require no adjustment, and run for years without attention.

b. Accurate table reversal within .004"; for safely grinding close to shoulders.

c. Two-speed manual table and cross traverse; for convenience in setting up the machine.

d. Single START-STOP lever for coolant flow, headstock spindle rotation and table traverse; reduces operating fatigue.



These are but a few of the many advantages offered by CINCINNATI FILMATIC Plain Hydraulic Grinding Machines. Compare them with your old plain grinders and you'll see why it will pay you to replace now. Complete data in catalogs No. G-566-2 and No. G-603, or look in Sweet's Machine Tool Catalog.

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
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CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO
(Subsidiary of The Cincinnati Milling Machine Co.)

U.S. Imports on the Rise

New record for U. S. imports may be set in 1953. Metals and manufactures help the lift

IMPORTS into the U. S. may well set a new record in 1953. If the high mark of $10,967,000,000 set in 1951 does fall this year imports of metals and manufactures can be given a large share of the credit.

Preliminary totals for the first eight months of 1953 show imports of $7,387,500,000, and the monthly average has been about $940 million. That doesn't take into consideration the usual year end rush by importers to get Japanese cameras, British woolens, German cutlery and Italian glassware under the American Christmas tree.

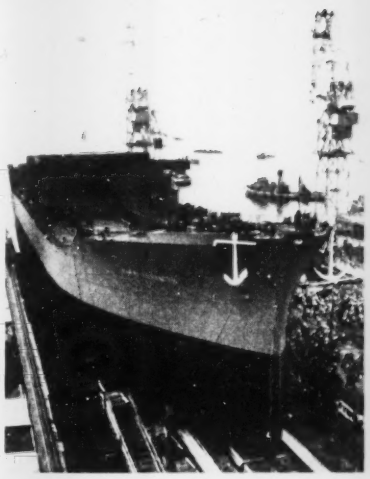
Shove Upward—Biggest gain for a major category of imports was in metals and manufactured goods which totaled $1,109,800,000 for the first half of 1953 compared with $893,900,000 for the first half of last year. Imports of metals and manufactures, except machinery and vehicles, declined from $209 million to $201.7 million from June to July, 1953. That reflected lower imports of refined copper, lead pigs and bars and zinc. But increases were registered in imports of unrefined copper, aluminum and manufactured products.

Since commercial exports (excluding military aid shipments) dropped 13 per cent for the first seven months of 1953 compared with 1952, the gap of commercial exports over imports for that period this year receded to $540,300,000 against $1,899,100,000 for the first seven months of 1952.

Without More Help—Apparently, foreign goods now find a good market in the U. S., thanks to the accumulated effects of low U. S. tariffs and customs simplifications, even without further relaxation of trade barriers.

U.S. Policy in Action

Westinghouse Electric Corp. has put the U. S. policy of helping other countries get on their own industrial feet into effective action. For example, the buildings for the three Westinghouse 75,000-kw thermal electric power plants being built for Kyushu Electric Power Co. and Kansai Electric Power Co. Inc., both of Japan, will be constructed by the Japanese. Installation of all equipment will be done by the Japanese under supervision of Westinghouse engineers. Under an agreement with Kyushu and Kansai, the Westinghouse power plants will serve as prototype units for the Japanese electrical industry.



New Tanker for Italy

The Italian merchant marine will soon have the services of the 32,000-ton *Mare Adriacum*, one of the world's fastest tankers. The ship's turbine engine was produced by International General Electric Co. at Lynn, Mass. It was launched, above, in Trieste

Two Generators for Italy

Two Westinghouse 50,000-kw turbine generators and related apparatus have been placed in operation at Societa Edison Co.'s "Emilia" station at Piacenza, Italy.

The new generators are the first of reheat design ever to be exported by Westinghouse.

Canada Frees Nickel

Canada has freed purchase of primary nickel from government control following termination of the International Materials Conference allocations at the end of the third quarter and because, as C. D. Howe, Canadian minister of defense production, puts it, "Demands for defense and commercial purposes now can be met."

Germans Eye U.S.

As an antirecession measure, German steelmakers would like to get U. S. investment capital

THAT SUMMER LULL in European steelmaking (see Sept. 14, p. 73) has lengthened into fall, and German steelmakers, among others, don't believe the bottom has been reached yet.

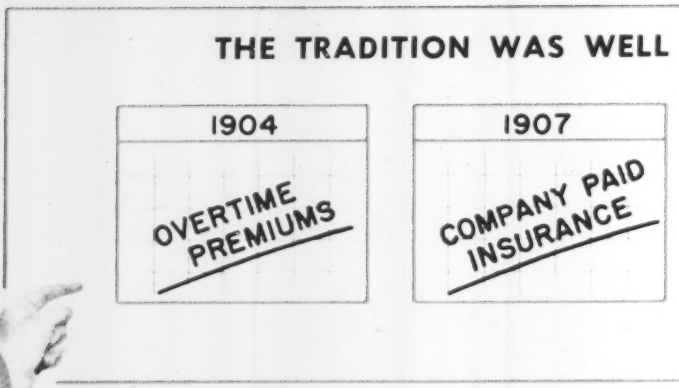
German steel production went from 1,398,000 tons in July, 1953, to 1,349,000 tons in August to 1,320,000 tons in September. French production over the same period dropped from 1,129,000 tons to 795,000 tons and rose again to 1,081,000 tons. Italian output went from 352,000 tons in July to 286,000 tons in August, and September figures were not available at this writing. Other continental producers follow the downward pattern.

Like the U. S.—As a result German steelmakers are not pushing for plant expansions but are drumming hard for investment money to make capital improvements. They would like $1.2 billion; so far only $288 million has been invested in metallurgical plants since the currency reform. Where the rest of the investment money is coming from, no one seems to know. But the German steelmakers would like it to come from U. S. private sources.

Tariff Plan Proposed

Herbert Barchoff, executive vice president, Eastern Brass & Copper Co., New York, has devised a tariff system which, he believes, would satisfy the best interests of both high and low tariff proponents.

Mr. Barchoff's proposal is that the tariff rate for a particular product should be scheduled so that the closer the European wage in an industry approaches the American wage standard, the lower our tariff for that industry should be. When and if the foreign labor costs reach the American equivalent, that product would enter the U.S. duty free. Such a plan would protect American business and labor against competition based on substandard wages.



Burroughs' Personnel Ideas Add Up to Efficiency

Here's how a business machine manufacturer's industrial relations program pays dividends

UNIONS HAVE BEEN knocking at the door of Burroughs Corp., Detroit, for a number of its 65 years in business. To date the 20,000 Burroughs employees have taken a look at the union wares and closed the door. Apparently they just don't want what the union has to sell, though Burroughs itself has never condemned the union movement as such.

Perhaps more than any other single fact, the consistent rejection of a union by its employees points up the basic efficacy of Burroughs' industrial relations program.

Philosophy—"As we see it," says youngish Frank G. Armstrong, assistant director of industrial relations, "the real heart of good industrial relations is remembering that employees and management are individuals working together in a common enterprise. We're genuinely concerned about our employees' welfare and their problems, and just as we are interested in our employees they are interested in Burroughs' welfare and its problems."

That means clear channels for two-way communication, and Mr. Armstrong spends a good part of each of his business days clearing those channels. He started off one October day studying an employee proposal for improved working conditions, an idea that grew out of one Burroughs experiment in improved management-employee communications.

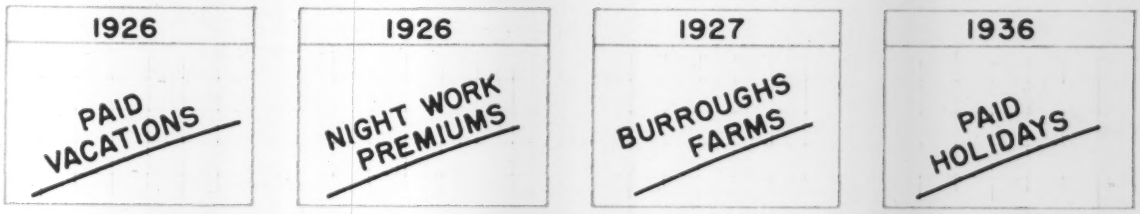
Preliminary — Last June the company initiated a management-employee representative consultation program. The employee representatives will be freely chosen every six months by personnel of the various departments on a basis of one for each 25 workers in smaller departments, one for each additional 50 in departments over 50 employees. Instituted "to develop maximum understanding and co-operation through a free exchange of viewpoints and information on matters relating to the operation of our business," the meetings deal with any subject pertaining to the work of a group of employees.

Typical topics brought up at the meetings by the representatives at the request of their department constituents include clarification of the pay system, reclassification of job groups, a desire on the part of one group to have its job name changed, ways for improving production methods and even a suggestion that a traffic light be installed at an intersection near the plant to expedite evening traffic.

Policy—To be sure that all facts are considered in making a decision and that all workers receive the information at the same time, management representatives issue a formal statement when a decision has been reached indicating the factors involved and the reason the ruling was so made. Mr. Armstrong reports that as the meeting program has gained momentum the suggestions grow more realistic and fundamental in scope. Indications are strong that the value of the meetings will continue to increase both to employees and to management.

Continued is the formalized grievance procedure for individuals which preceded and supplements the group grievance procedure. As detailed on all bulletin boards, grievances are first taken to the foreman or immediate supervisor, next to the division superintendent and then in writing to the plant manager. The personnel office even assists in writing out the grievance if assistance is desired, and the plant manager, in conjunction with Mr. Armstrong, conducts a thorough investigation. If the employee is still dissatisfied with the decisions, the written grievance is investigated by the v.p.-director of industrial relations who

ESTABLISHED BEFORE THE UAW AND UEW WERE FOUNDED



then presents his recommendations to the president for his decision.

Practice—After spending part of his morning studying a group proposal, Mr. Armstrong next had an investigating job to do on an individual grievance. One employee complained that work standards in his department were unrealistic.

Behind the grievance procedure is a Burroughs philosophy that an unsettled grievance will fester and grow, prevent the worker from doing a good job and possibly spread to others. "If there is something about your job that's bothering you, bring it out in the open, discuss it frankly with management," says Burroughs. It is emphasized to employees that this procedure may be used without fear of retaliation. And despite the accessibility of the president, few gripes go the whole route. Most are settled at the foreman level.

Performers — But that's understandable because the Burroughs foremen are actually the personnel policy administrators. They are part of management and they speak for management. As Frank Armstrong puts it, "We're just here to advise and assist. The foreman at Burroughs is kept informed on what goes on in the company so he can discuss developments intelligently with his workers. Supplying the foreman with the answers eliminates guessing, stops rumors and gives every worker direct contact with informed management."

Part of Mr. Armstrong's afternoon was spent in discussing with a foreman the steps to take with one worker in his department who was ignoring some safety rules.

Problems — Burroughs believes that employees respect and even prefer a supervisor who is fair, yet firm in all his dealings with them. "Discipline administered in a just, prompt and consistent way can actually be a morale booster," says Mr. Armstrong. "Employees who know that the rules are in the best interests of the group realize that they benefit when the few who violate the rules are corrected."

In achieving just, prompt and consistent discipline, Burroughs prepared a list of violations with carefully detailed penalties for the first, second and third offenses. Depending on the seriousness of the action, the penalties range from verbal reprimand to discharge. These lists are posted on the bulletin boards, and every employee knows the offenses and the penalties he can expect if he violates the rules.

Plant Community — "Burroughs regards discipline as a corrective rather than punitive matter," says Mr. Armstrong "and every discipline case is reviewed to be sure policy has been followed." (He spent much of the rest of the afternoon reviewing a couple of cases.) The employee is given every opportunity to be a good member of the plant community and to get ahead in the organization. For Burroughs believes sincerely that its strongest asset is a good work force, an integrated competitive team.

This principle applies also to upgrading within the Burroughs organization. Promotion from within based on seniority for hourly workers is a long standing policy, and the route of advancement is carefully diagramed so that an employee knows where he is going. The only exceptions are specialized occupations requiring outside training to qualify for the jobs.

Personnel Policies—The selection of qualified personnel, the provision of training opportunities, equitable and fair compensation and other policies essential to good human relations are well established. Programs of vacation with pay including a half-day before Christmas and New Year's, a company-owned recreation area on a wooded lake near Detroit for the use of employees, sick leave, insurance and a retirement plan presently paying retired nonsupervisory personnel an average monthly income of $152.94 per month including social security are other reasons why over half of Burroughs employees have been with the company more than ten years.

Burroughs' personnel policies are like a breath of fresh air in a smoke-filled union-management conference room. The company has not only kept competitive with unionized labor gains but actually offered many benefits years before some unions were organized. Today its monthly labor turnover rate averages 1.51 per cent compared with the level of industry generally, 1.10 per cent, while the Detroit area level is 6.13 per cent.

●*This is the ninth in a* STEEL *series on Management at Work. The last one, on a traffic manager, appeared Aug. 31, p. 40.*

for Greater Strength with Lighter Weight

in modern material handling equipment

The increasing use of the Evans DF Loader reflects the progress of railroads toward more efficient material handling methods.

In the DF Loader there is high strength with minimum weight through the use of N-A-X HIGH-TENSILE steel. This low-alloy steel has 50% greater strength than mild carbon steel, with greater resistance to corrosion with either painted or unpainted surfaces.

You can get the same results as Evans. Your product can be made stronger, lighter in weight and longer-lasting, when you specify N-A-X HIGH-TENSILE steel.

N·A·X HIGH-TENSILE STEEL

THE EVANS DF LOADER is a product of Evans Products Co., Plymouth, Mich. DF means Damage-Free, Dunnage Free.

NAILABLE STEEL FLOORING for boxcars, flatcars and gondolas is made of N-A-X HIGH TENSILE steel, and is a product of Steel Floor Division, Great Lakes Steel Corporation.

Engineering data on these products available upon request to the manufacturers.

The "Wonder Bar," a section of which is shown at left, is a vital part of the Evans DF Loader. It is a wooden bar reinforced by a Z-bar made of N-A-X HIGH-TENSILE.

The "Wonder Bar," when locked into place, secures all kinds of lading. It is strong enough to resist shifting load stresses in moving boxcars, yet so light that one man can lift it into position. The DF Loader provides real operating economies for both railroads and shippers.

Another modern product for efficient transportation equipment is Nailable Steel Flooring, also made of N-A-X HIGH-TENSILE steel.

GREAT LAKES STEEL CORPORATION

N-A-X Alloy Division — Ecorse, Detroit 29, Mich.

NATIONAL STEEL CORPORATION

By FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

Those accessories you're buying are bringing in $1 billion a year in sales to accessory manufacturers. They're brain children playing a role in automotive design

DETROIT

JUST AS AN accessory after the fact defeats justice, accessories after the facts frequently defeat the prospective car buyer. But if you're the type who feels like going through the roof when the dealer gives you that staggering total, cheer up! The roof was once an accessory too.

So were bumpers, windshield, side-curtains, lights and horn to name a few. And along about 1910 when cars were first advertised as "completely equipped," the equipment on one model included folding windshield, hand crank, side-curtains, 42 x 4 inch tires and "one extra inner tube." Price: $4000.

Ubiquitous Pump — Presumably this model also included a tire pump. In the days of porous rubber which would retain air only a few days even when not abused by the rocky roads of the time, the tire pump quickly became a necessity and is generally accepted as the first item to move from accessory to standard equipment listing.

This route of accessory to necessity has been followed often in the history of the auto industry. Windshield wipers, headlight dimmer switches, rear view mirrors, electric starters, sun visors and many more devices found on the least expensive cars built today began their existence as accessories. And behind their acceptance are the gamblers of the auto industry, the accessory manufacturers.

A Gamble—Perhaps you hadn't realized it, but few accessories are made by the automakers though they may bear the company name. Figuring that they lose enough on the sure things in their business, the automakers leave the gambling to the accessory manufacturers. But if an accessory maker wins he may lose. For at that point when the device has achieved virtually universal acceptance, the automaker will occasionally take over production of the device himself.

To illustrate how the system works, let's suppose an accessory manufacturer decides he would like to produce a simulated brick terrace complete with top soil and seeds for rear deck lids. If he takes his idea to the auto companies they will tell him that it's hard to judge how many people will like gardening and it just can't be used. He can then either drop his idea or market it himself, and he decides on the latter course.

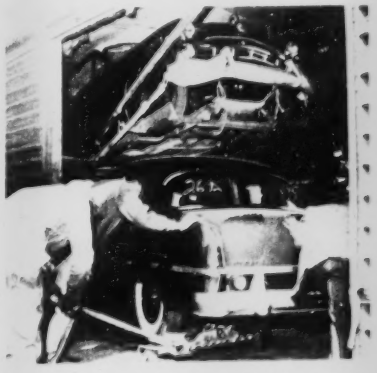
A Success—If his sales flop the story ends right there, but let's suppose that the rear deck terrace has a definite appeal to urban apartment dwellers. Some motorists who observe them taking gardens out to the country on Sundays will want one for their cars. Others, of course, will feel that a garden looks lousy on an automobile and wouldn't be seen dead with one on their cars.

But the important thing is that the accessory manufacturer has his foot into the door. Some people will never own another car without a rear deck terrace and the volume is growing. To get the jump on his competition, the manufacturer now returns to the auto company and shows them that his product has acceptance and urges them to carry his rear deck terrace exclusively.

In the Bag—Realizing that the item is one which their customers are going to be demanding, the auto company requests samples for standards testing. The quality of the finish on the simulated bricks is carefully salt spray tested, the method of attachment is evaluated and perhaps the soil is analyzed. After this careful consideration, the auto company agrees that his is the best simulated brick rear

Every day some 2000 cars roll away from Chrysler Corp.'s Detroit plants in the trailers of haulaway trucks

Loaded with 800 new cars, a Great Lakes freighter glides down the Detroit river on its way to Buffalo



Twelve per cent of Chrysler Corp.'s cars leave Detroit by rail, carefully braced in 50-foot steel box cars

To Customers Everywhere

The more than 5 million cars and trucks flowing from assembly lines this year present a giant transportation problem. To move its 800,000 car output from Detroit plants to dealers, Chrysler Corp. relies heavily on rail, water and highway transport

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deck terrace on the market, assigns it a part number and lists it in the catalog.

This is the accessory maker's Utopia. The automaker works with him in developing rear deck terraces for future models that are properly contoured and styled to the car which in turn may boost sales still further. Often in working closely with the manufacturer of an accessory, the automakers will suggest means for improving the product that the original manufacturer had not previously considered.

The Case of Clocks—Some accessories never grow beyond this point. Automobile clocks, for example, are found in about 63 per cent of all cars produced annually. Clock manufacturers are given the style and color of lettering to blend the clock with the other instruments on the dash. If a hole is provided for the clock the dimensions are also worked out with the clockmaker.

A few makes carry the clock as standard equipment while others like Plymouth, recognizing the limited appeal of clocks, have eliminated the hole for the clock in the dash which was costly and now mount it above the dashboard.

Acceptance—But to return to our rear deck terrace maker. The time may come when nobody would think of buying an automobile without a rear deck terrace. When that time comes the probability is high that the automaker will decide to form the terrace right into the rear deck. This puts the accessory maker right out of business if he hasn't been developing new products, and the chances are good that he has.

Thus the circle begins all over again, and it's a circle of great interest and value to the automakers. They recognize the value of accessories today in probing the future of standard equipment tomorrow, and the accessory maker receives co-operation in developing his product if it appears to have merit. And for the accessory maker who brackets the auto industry with his product and keeps his costs down the future is bright. In many cases the auto companies can never hope to supply the product themselves as cheaply as they can buy it.

Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,343	595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Sept. 19	146,912	147,748
Sept. 26	140,953	141,228
Oct. 3	142,824	143,234
Oct. 10	148,779	138,035
Oct. 17	151,689	138,088
Oct. 24	152,000*	144,747

Source: Ward's Automotive Reports
*Estimated by STEEL.

Now Standard—Bumper guards, dual tail lights and rear fender gravel shields are among accessories which have largely gone the standard equipment route in recent years. As competition sharpens directional turn signals, back-up lights and windshield washers look like good candidates to become standard equipment on most cars in the immediate future.

It is estimated that accessory manufacturers will sell more than $1 billion in gadgets this year, and their fertile brains you may be sure are sprouting more ideas for the future. But the next time you see a new accessory, don't laugh, for the accessory of today is indeed the necessity of tomorrow.

Exhaust Notes

Oldsmobile reportedly will bore out its 1954 engines to 3⅞ inches. At this point, Oldsmobile, like many other automakers, is going to find itself as close to the water jacket as it can safely go. Lengthening the stroke to increase the displacement of the engine involves greater piston friction in the engine and seems improbable. The second alternative as the horsepower race continues is to increase the bore still further through the use of wet sleeves.

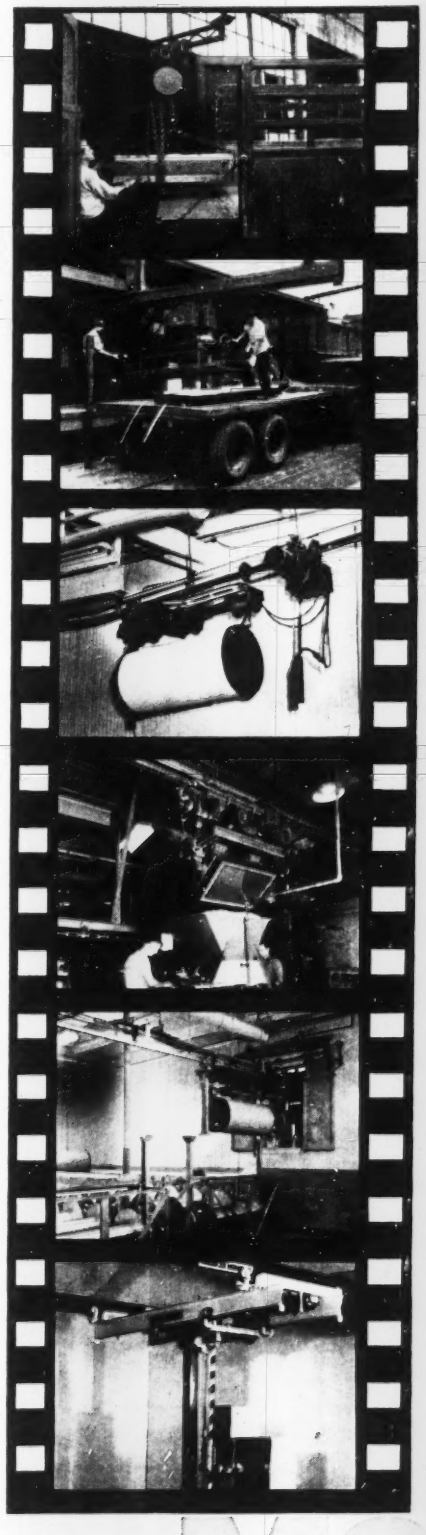
This technique is used in many European engines but heretofore has been regarded as too costly for American mass production. Advantages include better cylinder wall cooling and the fact that the sleeve can be replaced in the event of scoring without the need to rebore or replace the engine block. Cadillac reportedly will utilize this device to increase its bore to 4 inches in 1955. Unique in the design will be the utilization of aluminum sealers at the bottom of the sleeves if preliminary indications are correct. The step is a logical one and should involve some fabrication techniques of unusually high interest.

Auto Quotes

Production facilities at Chrysler Corp.'s Los Angeles plant will soon boast two new assembly lines and new body finishing operations, says John P. Mansfield, Plymouth Division president. Requiring about 550,000 square feet of floor space in a plant addition built in 1952, the new facilities are slated for operation early in 1954.

Regular quotas of Cadillacs will be reaching dealers by mid-November, says Don E. Ahrens, general manager of the division. Full production of 2500 cars per week was anticipated on Oct. 26 through increases in the supply of Dynaflow transmissions which limited production following the Livonia fire Aug. 12. Despite the production slowdown, however, Cadillac surpassed its 1952 output on Oct. 12 when the 90,715th car rolled off the line.

Building cars which make it easier for the driver to stay out of accidents is a major goal of auto manufacturers, says Charles A. Chayne, chairman of the Engineering Advisory Committee of the Automobile Manufacturers Association. Improved visibility, power steering, power brakes and increased acceleration are examples of recent developments to help accomplish this objective. "Power steering," declared Mr. Chayne, "puts greater control in the driver's hands. Power brakes lessen the time it takes to get the foot from the accelerator to the brakes. Acceleration decreases the time a car must remain on the wrong side of the road and smooths out the flow of traffic on congested highways."



Quickly removes die blocks from trucks

Saves $30 each truck unloaded

Delivers beams to another building

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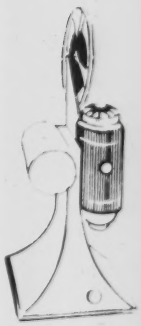
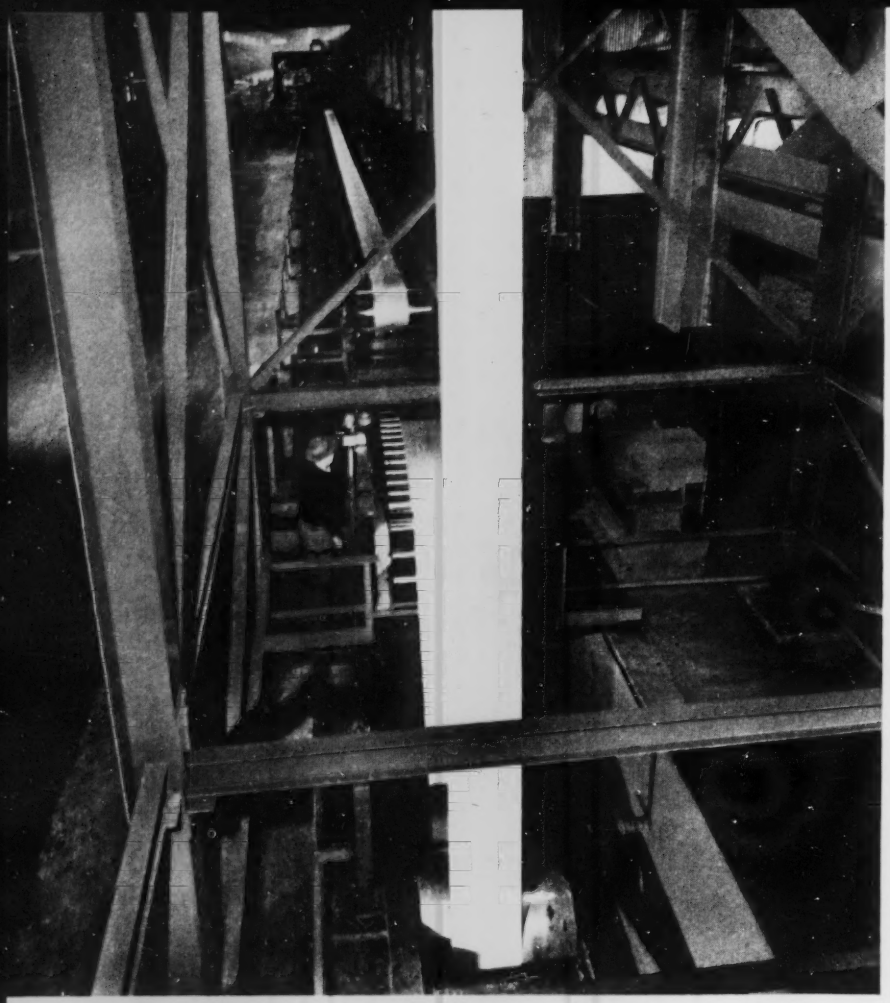
a 16 mm movie that discusses handling problems common to every industry



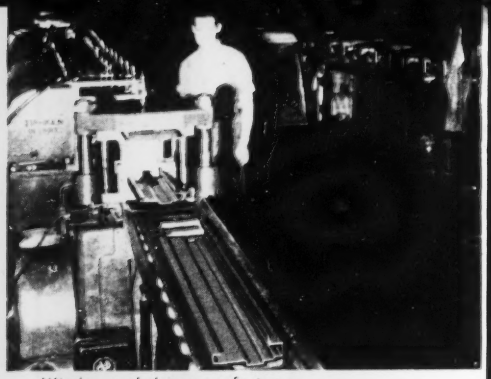
Before you decide upon any material handling equipment, let us loan you "Up and Over". This 16 mm film shows many installations of American MonoRail overhead handling equipment. You will see hand operated to fully automatic systems — one or more that may be particularly adaptable to your operations. The film is educational, interesting, informative and shows the way to economical, safe and time-saving material handling. Your ticket of admission is only a note to us asking for a print. It will help us if you advise the exact date, as close as possible, when you wish to use it.

THE AMERICAN COMPANY

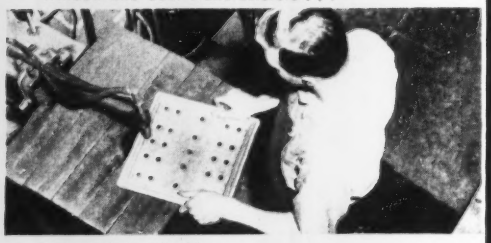
13102 **ATHENS AVENUE** **CLEVELAND 7, OHIO**



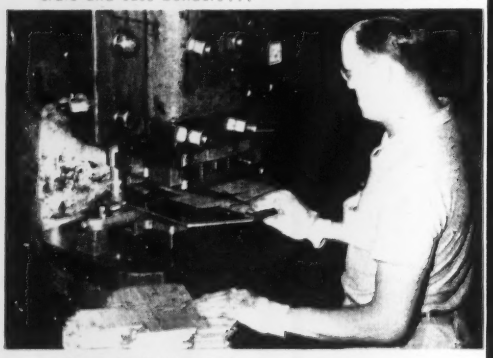
Galvanite* production boosted to aid . . .



Window and door manufacturers . . .



crate and case builders . . .



radio and television makers . . .

Increased use of Galvanite* compels SHARON to up capacity to 50,000 tons a year

The demand for Galvanite* has increased at such a tremendous rate since the close of World War II that expanded facilities at Sharon's Roemer Works for the production of this material were inevitable.

Recently, after many months of design and construction, a special new 50,000 tons per year line was set into operation, to help satisfy the demand, and to provide better delivery.

Galvanite* is a special process zinc-coated steel that discourages rust, fights the weather, firmly grips paint. It can be formed, or otherwise fabricated, with all the ease of plain steel.

It has been successfully used as a material for window casements, doors, milk crates, suitcase frames, flexible cable, radiator tubing, roof deck, outlet boxes, etc., and quite recently has boomed as an ideal metal for television and radio.

New Galvanite Booklet FREE!

A new Galvanite booklet is available to you with information on this popular special coated metal. Write direct or contact the Sharon office nearest you for YOUR copy.

*Trade name copyrighted by the Sharon Steel Corporation

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Cleveland	Los Angeles	New York
	Montreal, Que.	Rochester
Detroit	Cincinnati	San Francisco
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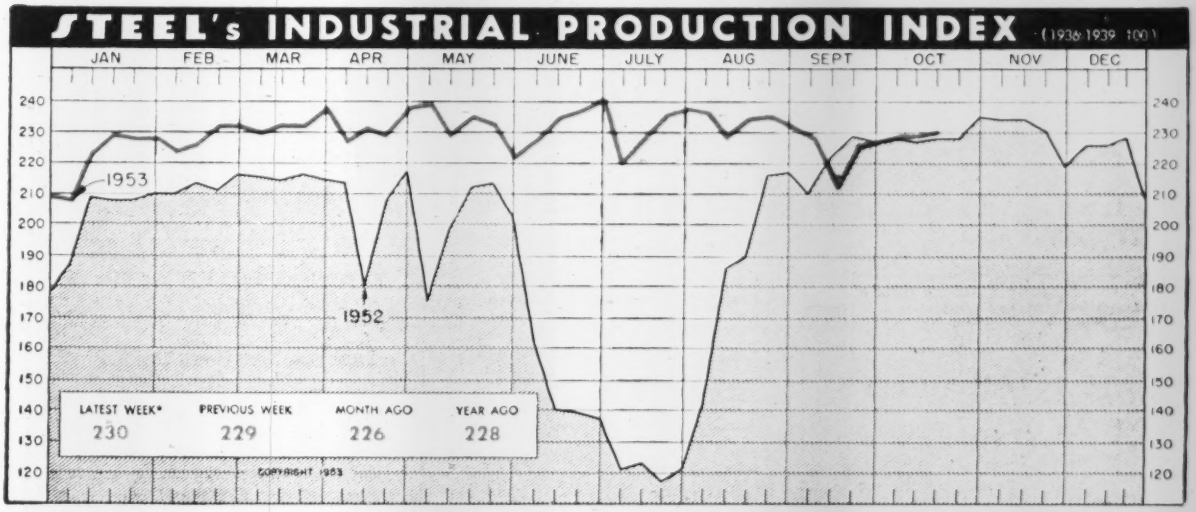
Wherever there's Weather, specify **Galvanite**

SHARON STEEL CORPORATION *Sharon, Pennsylvania*

The Business Trend



*Week ended Oct. 17

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%

Production adjustments continue. Recent weekly decline in retail sales is ominous. If it continues, greater adjustments lie ahead

INDUSTRIAL OUTPUT has tended to level off during the first three weeks of October. Measured by STEEL's industrial production index, output in each of these weeks has been about 229 per cent of the 1936-1939 average. During the latest week, the week ended Oct. 17, a production rise of one point is indicated on the basis of preliminary figures.

Production of some important industries appears to be headed downward for at least the next several weeks, however.

Signs of the Times . . .

Announced cutbacks in steel production along with a decline in railroad freight loadings of ore and bituminous coal output indicate that the steel industry's operating rate may slip slightly from the present 95 per cent level. New production cutbacks have been made by the American Steel & Wire Division of U. S. Steel and Allegheny Ludlum Steel Corp.

Expansion Problem . . .

Looking further into the future, the steel industry is still faced with the problem of having its securities considered an attractive enough investment. Though the net income of several large steel producers was vastly greater in the third quarter than in the same quarter of 1952, due to the price rise which followed the wage hike, lower scrap prices and a reduction in overtime worked, shares of steel producers do not return the income percentage that some competitors do largely because of the high labor cost per dollar of sales.

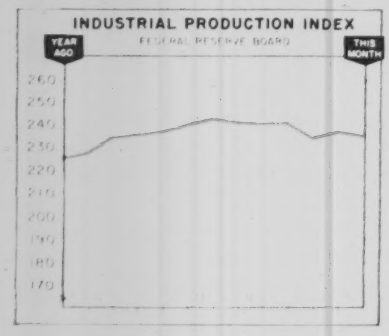
Sliding Auto Output . . .

Model changeover time at GM and Ford in the coming months will cause automobile industry production to slide from the outturn level of the latest week, the week ended Oct. 17, when U. S. outturn was 144,626 cars and trucks, a seven-week high, according to *Ward's Automotive Reports*. A moderate production downturn should be welcome news for dealers, whose stocks of new cars are considered about 20 per cent too high for this time of year. Yet, the near record production of the year to date and the high stocks may bring an outturn decline that will last longer than anticipated. The increased industry competition during the latest week the Big Three expanded their share of total car output to 95.3 per cent has sidelined the independents for long periods of time already in this hefty production year. On the plus side of the ledger, even if outturn drops further or for a longer period of time, the net income per car may increase. Expanded installation of power braking units could accomplish this. In 1952, only 114,000 of these units were added. Present expectation is that power braking installations in new cars this year will be about 550,000 units.

Housing Starts Reduced . . .

Housing starts during the first nine months of 1953 totaled 863,400 units, the Bureau of Labor Statistics says. Activity was only slightly less than in the corresponding period last year but about 25 per cent below the number of starts in 1951. On a moving trend from month to month activity in September was down slightly from the preceding month. September was also the fifth consecutive month in which a decline occurred.

A breakdown into public and private housing reveals that private starts are high but moving downward and public starts are

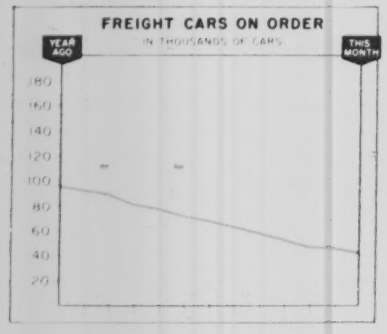


Industrial Production Index

1935-1939 = 100

	Total Production 1953	Total Production 1952	Iron, Steel 1953	Iron, Steel 1952	Non-ferrous 1953	Non-ferrous 1952
Jan	236	220	287	261	249	215
Feb	240	222	290	261	259	217
Mar	243	229	297	262	261	218
Apr	241	216	292	245	264	218
May	240	211	291	235	265	220
June	240	203	288	142	258	212
July	233	195	279	141	251	201
Aug	230	215	277	241	245	212
Sept	234	225		267		221
Oct		227		276		225
Nov		234		283		240
Dec		235		287		245
Avg		218		243		220

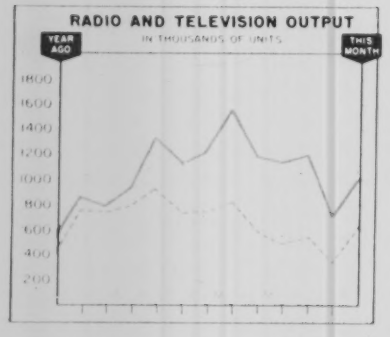
Federal Reserve Board



Freight Car Awards and Backlogs

	Awards 1953	Awards 1952	Backlogs* 1953	Backlogs* 1952
Jan	4,336	5,338	77,111	120,241
Feb	2,284	7,358	71,883	118,900
Mar	3,379	5,619	68,553	115,854
Apr	2,432	397	62,637	108,270
May	1,651	2,502	57,345	103,910
June	1,463	3,264	52,315	99,615
July	1,632	1,536	47,423	95,265
Aug	3,913	4,558	44,735	94,761
Sept	3,914	3,628	42,198	94,477
Oct		1,423		90,708
Nov		2,878		87,667
Dec		1,159		80,296
Total		37,261		

*End of month
American Railway Car Institute

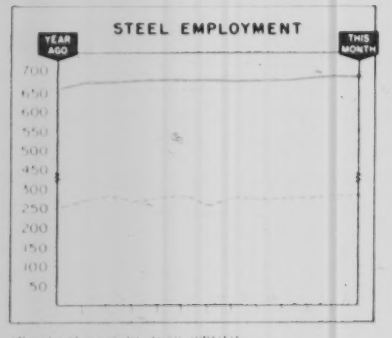


Radio and Television Output

Thousands of Units

	Radio 1953	Radio 1952	Television 1953	Television 1952
Jan	1,093	632	719	405
Feb	1,102	759	731	469
Mar	1,349	976	810	511
Apr	1,158	848	568	323
May	1,109	748	482	309
June	1,164	874	521	361
July	671	442	316	199
Aug	902	541	601	308
Sept		596		566
Oct		772		724
Nov		924		780
Dec		1,326		921
Total		9,741		6,096

Radio Electronics Television Mfrs. Assn.



Steel Employment, Payrolls

	in Thousands 1953	in Thousands 1952	in Millions 1953	in Millions 1952
Jan	685	672	$256.4	$252.2
Feb	686	674	261.3	234.9
Mar	685	672	281.0	242.7
Apr	686	670	278.0	225.6
May	686	662	281.0	223.1
June	690		282.1	*
July	696		288.1	*
Aug	696	660	287.3	250.4
Sept		674		269.4
Oct		677		282.9
Nov		680		269.7
Dec		684		280.0

*Not available because of steel strike
American Iron & Steel Institute

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Oct. 5	Heaters	Sept. 21	Refrigerators	Oct. 5
Durable Goods	Oct. 12	Machine Tools	Oct. 5	Steel Castings	Oct. 19
Employ. Metalwk.	Sept. 28	Malleable Castings	Oct. 19	Steel Forgings	Oct. 19
Fab. Struc. Steel	Sept. 21	Prices, Consumer	Sept. 28	Steel Shipments	Oct. 12
Foundry Equip.	Sept. 14	Prices, Wholesale	Sept. 28	Vacuum Cleaners	Oct. 12
Furnaces, Indus.	Sept. 14	Pumps	Aug. 24	Wages, Metalwk.	Sept. 28
Gears	Sept. 21	Ranges, Elec.	Oct. 5	Washers	Sept. 21
Gray Iron Castings	Oct. 19	Ranges, Gas	Oct. 12	Water Heaters	Sept. 14

already down considerably. From January through September this year, private activity exceeded any corresponding period with the exception of the record year, 1950. But, these starts in September were down from the preceding month, for the fifth consecutive month.

Public housing activity is largely responsible for the reduced total of housing starts this year, as compared with 1952. Activity during the first nine months of 1953 was 33 per cent below the corresponding nine-month period in 1952.

Construction Pace Up . . .

Although these figures present a picture of gradually declining housing activity between years and for the coming year, they are only part of the future construction industry story. Nearer to the full story is the number of construction contract awards made during the three quarters of 1953 as compared with the same 1952 period. These figures look ahead further, since there is a lapse of several months between the award and the start. They reveal, on an award basis, that construction in the 37 states east of the Rockies during nine months of 1953 is up 1 per cent from 1952. The nine month total is $12,857,261,000, F. W. Dodge Corp. reports. The 11 per cent gain in heavy engineering awards is responsible for the 1 per cent increase. It more than offsets the 3 per cent decline in residential awards.

Oil Output Cut . . .

The sizable drop in petroleum production to a daily average of 6,313,450 barrels during the week ended Oct. 10, from approximately a 6,433,000-barrel daily average in the previous week—does not have as much future economic significance as does the declining production of steel, automobiles and houses, but it serves notice that the oil industry is solving its stock imbalance by reducing output rather than prices.

Job Reductions . . .

Reductions in the production of steel, automobiles and housing will

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[1]	95.0	95.0	105.5
Electric Power Distributed (million kwhr)	8,265	8,307	7,681
Bitum. Coal Output (daily av.—1000 tons)	1,548	1,538	1,520
Petroleum Production (daily av.—1000 bbl)	6,320[2]	6,313	6,528
Construction Volume (ENR—millions)	$268.9	$170.0	$333.3
Automobile, Truck Output (Ward's—units)	151,689	148,779	138,088
TRADE			
Freight Car Loadings (unit—1000 cars)	800[2]	804	838
Business Failures (Dun & Bradstreet, no.)	169	186	139
Currency in Circulation (millions)[3]	$30,412	$30,374	$29,617
Dept. Store Sales (changes from year ago)[3]	5%	3%	+6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,881	$18,178	$14,951
Federal Gross Debt (billions)	$273.0	$272.9	$264.8
Bond Volume, NYSE (millions)	$11.9	$13.1	$14.2
Stocks Sales, NYSE (thousands of shares)	5,743	4,906	5,956
Loans and Investments (billions)[4]	$79.1	$78.9	$77.4
U. S. Gov't. Obligations Held (billions)[4]	$31.4	$31.7	$33.1
PRICES			
STEEL's Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	202.4	203.5	217.2
All Commodities[7]	110.1	110.3	111.1
Commodities Other Than Farm & Foods[7]	114.6	114.6	113.0

[1]Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1953, 2,254,150; 1952, 2,077,910. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939 = 100. [6]1926-1928 = 100. [7]Bureau of Labor Statistics Index: 1947-1949 = 100.

send more men into unemployment. Their number may be small but it will swell the lists of those already unemployed due to sporadic dislocations in various industries. Latest firms to reduce their employment force are American Locomotive Co., which plans to lay off between 400 and 500 employees this month because of the continuing drop in locomotive orders, and Sylvania Electric Products Inc., which will reduce its working force by 100 within the next two or three weeks. The number of business failures, which is running well above the levels of 1952 and 1951, also increases the number of unemployed, especially where these are manufacturing concerns. During the week ended Oct. 10, manufacturing failures showed an appreciable rise from 42 to 51, Dun & Bradstreet Inc. relates.

Other Indicators . . .

Other factors in the economy are shaping up like this:

Wholesale Prices — They advanced 0.4 per cent between August and September, but in recent weeks they have moved downward by even more, largely due to lower farm prices.

Retail Sales—Volume in recent weeks is said to be from 1 to 6 per cent higher than a year ago, but department store sales compared in the same manner have declined during the past two weeks. This means that either department store sales are falling further in relation to all retail sales or that recent retail sales have registered a percentage gain in the lower part of the estimated range, which in turn would show a downward trend of retail sales from past months.

Individuals' Savings—While it keeps increasing, the part of it represented by demand deposits continues to be reduced. The have's are increasing their holdings and those that don't have enough are reducing theirs.

Money Availability — The Big Three finance companies have reduced their rates on commercial paper for the second time in two weeks. Previous to the first action, there hadn't been a rate cut for two years. A continued rise in the supply of funds available brought about the reductions. With payments good, almost all financial institutions will have considerably more to lend next year. They say they will be selective, but main question is whether there will be as many borrowers then as there are now.

IT DOESN'T COST ONE

Nickel More

TO DO BUSINESS WITH HELPFUL

KENILWORTH STEEL

and

THESE ARE THE EXTRA SERVICES KENILWORTH'S CUSTOMERS ARE RECEIVING

Dependability, convenience, top quality, and fast service are terms or reasons given in many instances to command an extra price. But Kenilworth customers know it's standard equipment here—experience it in order after order. Honestly, we believe you'll enjoy doing business with Kenilworth, too,—besides paying attention to every detail of your orders you'll experience the pleasantries of good business relationship. We can hear you saying it now, "let's give them this tough one for a trial." O. K., we're ready and waiting.

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IT'S PERFORMANCE THAT COUNTS

...there's more to a champion than the tape measure shows!

Champion Pitcher . . .
he keeps control in the tight spots!

Average Pitcher . . .
he may measure the same . . . but he loses the tight games.

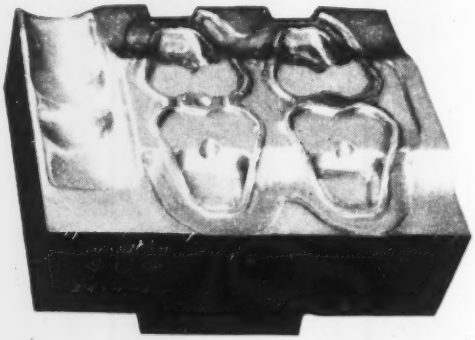
HARDTEM DIE BLOCKS

perform like "champions" in your production line!

Heppenstall Hardtem Die Blocks perform like "champions" because they possess those extras that result in superior quality. Their patented steel analysis resists softening and heat checking in service. Records from plants using Hardtem Die Blocks prove the following benefits for production:

- ★ **Long life of dies**
- ★ **Less down time**
- ★ **Lower overall die cost**
- ★ **Holding of true dimensions**
- ★ **Longer production runs**

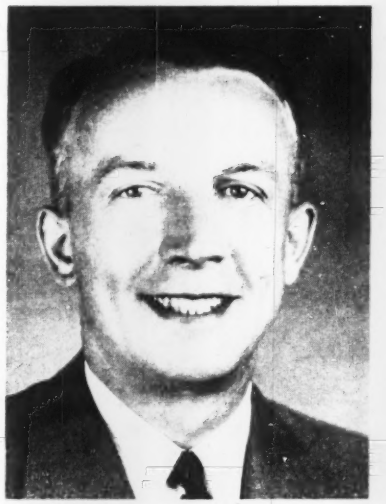
It will pay you to try Hardtem Die Blocks. Call Heppenstall Company, Pittsburgh 1, Pa. Sales Offices in principal cities.



Heppenstall

. . . the most dependable name in die blocks

Men of Industry



CLARENCE L. HOLMBERG
. . . Inland's gen. mgr. of sales

ELMER J. LELL
. . . sales mgr. for Wall Colmonoy

HAROLD P. SHERER
. . . Hertner Electric executive v. p.

Clarence L. Holmberg was appointed general manager of sales, **Inland Steel Co.**, Chicago. He succeeds **Anthony M. Ryerson**, who has been on a leave of absence due to ill health. Mr. Holmberg has been with Inland for 26 years and since January, 1952, has been assistant general manager of sales.

Loren C. Wheeler was made assistant sales manager of **Atkomatic Valve Co.**, Indianapolis. He was formerly in charge of sales, Climax Machinery Co., division of Arnolt Corp.

Ernest B. Lawton Jr. was made sales supervisor, screw machine products division, **Scovill Mfg. Co.**, Waterbury, Conn. He succeeds the late **Victor E. Hedberg.**

H. L. Humphrey was appointed vice president in charge of sales for American Brakeblok and Kellogg Divisions of **Dominion Brake Shoe Co. Ltd. of Canada**, Toronto.

Marcus N. Brooks was appointed purchasing agent for **Westinghouse Electric Corp.'s** television-radio division, Metuchen, N. J. **Edward B. Dawson** was made engineering manager, elevator division, to succeed **E. M. Bouton**, retired. **E. R. Nary** was appointed assistant director of headquarters works engineering for the corporation.

Elmer J. Lell was made sales manager for **Wall Colmonoy Corp.**, Detroit. He joined the firm in 1948 as midwest sales engineer and has recently served as assistant sales manager at Detroit.

At **Youngstown Steel Tank Co.**, Youngstown, **C. E. Stenson**, president and general manager, retired because of ill health. **A. W. Kelly**, chief engineer, is now general manager with responsibility for over-all operation policy of the company. **Wayne H. Hunter** was named general manager of sales in charge of sales policy, and **Robert M. Bentley** was named production manager.

George J. Ries, secretary and director of purchases, **Advance Aluminum Castings Corp.**, Chicago, was named assistant factory manager in addition to his other duties. **Max E. Allen** will serve as purchasing agent.

Thomas W. Plante joined **William M. Bailey Co.**, Pittsburgh, as assistant manager of sales. He was connected with Jones & Laughlin Steel Corp. for 25 years. He recently returned from South America where he spent the last five years in charge of blast furnace and raw materials departments of Compania de Acero del Pacifico in Chile.

Hertner Electric Co., Cleveland, subsidiary, General Precision Equipment Corp., elected **Harold P. Sherer** executive vice president. He has been vice president in charge of engineering for the last several years.

Arthur E. Nicholson Jr. was elected president, **W. H. Nicholson & Co.**, machine works, Wilkes-Barre, Pa., to succeed his uncle, **Harry S. Nicholson Sr.**, president since 1948. **John M. Robinson Jr.** and **Arthur N. Rinehimer** were made assistant general managers.

Forest S. Burtch is product sales manager of the newly formed construction materials department of **John A. Roebling's Sons Corp.**, subsidiary of Colorado Fuel & Iron Corp. He is succeeded by **Elmer A. Trask** as wire rope sales manager. Both men will work out of the corporation's Trenton, N. J., headquarters.

Volco Brass & Copper Co. Inc., Kenilworth, N. J., appointed **Robert J. Campbell** vice president in charge of sales. Mr. Campbell was formerly general manager at New York Brass & Copper Co. He will have headquarters in Newark, N. J., at Volco's general sales office.

Fred E. Fishman joined **Sipi Metals Corp.**, Chicago, in sales of brass

ingot, copper shot, copper-nickel shot, babbitt metals and other specialty alloys.

Charles M. Offenhamer was named assistant manager, Metals Research Laboratories, **Electro Metallurgical Co.**, Niagara Falls, N. Y., succeeding **Joseph R. Dawson**, retired.

Silica Chemicals Inc. announces election of **Harold G. Leibold** as a director. The company is a newly formed subsidiary of Cleveland Quarries Co., Amherst, O. **George S. Love** is secretary-treasurer.

National Research Corp., Cambridge, Mass., appointed **Sydney Minault** as chief engineer.

George W. Curtis, Milwaukee division sales manager, **Timken Roller Bearing Co.**, retired. Milwaukee industrial sales division responsibility has been divided among district offices in Milwaukee, Minneapolis and Moline, Ill. **Robert Morgan** continues as district manager at Moline while **Floyd Hartshorn** is district manager at Milwaukee. **Donald Van Orman** was made district manager of Minneapolis.

Dwight H. Lory, former assistant to the general manager of **Allis-Chalmers Mfg. Co.'s** Norwood, O., plants, was named assistant manager, Texrope Drive section, located at the company's Plant 2 in Cincinnati.

R. D. Mount was made manager of distributor sales and truck caster sales for **Bassick Co.**, Bridgeport, Conn.

American Blower Corp., Detroit, appointed **Wells A. Gardner** works manager and **A. F. L. Anderson** chief engineer. Mr. Gardner was formerly manager of the firm's Columbus, O., plant.

Carl T. Dostale was made plant superintendent, **Electro-Glo Co.**, Chicago.

William J. Stock was promoted to assistant superintendent of the foundry of **Shenango Furnace-Shenango Penn Mold Co.**, Sharpsville, Pa. He succeeds **James McCracken**, recently named assistant to the general superintendent of the plant.

CLARE R. KUBIK

W. J. CHAMBERLAIN

J. F. ROMANS

E. J. KOSSUTH

executive appointments at Motch & Merryweather

Motch & Merryweather Machinery Co., Cleveland, appointed **Clare R. Kubik** vice president for administration, **W. J. Chamberlain** director of sales, **J. F. Romans** director of engineering and manufacturing, and **E. J. Kossuth** director of used machinery.

Alex H. Homberger was named executive vice president in charge of foundry development and consulting activities for **U. S. Engineering & Mfg. Co.**, Chicago.

C. H. Smith, comptroller of **Cadillac Motor Car Division**, General Motors Corp., Detroit, was appointed special assistant to the general manager. Replacing Mr. Smith as divisional comptroller is **Alexander F. Swetish.**

James D. Weber is application engineer in the Detroit district sales office of **Reliance Electric & Engineering Co.**

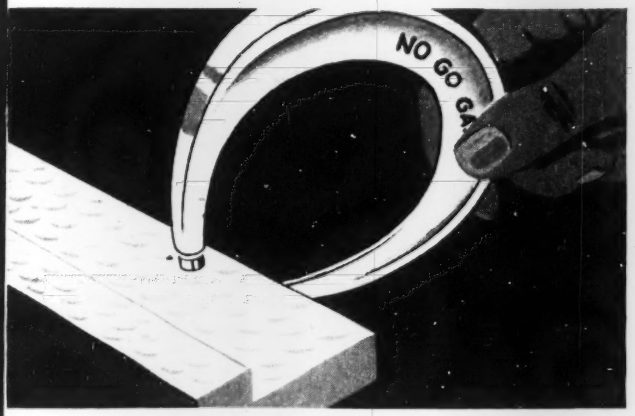
Basic Refractories Inc. named **A. M. Caito** works manager of its Maple Grove and Bettsville, O., operations.

Thaddeus Augustyn was elected vice president, **American Research Corp.**, Bristol, Conn.

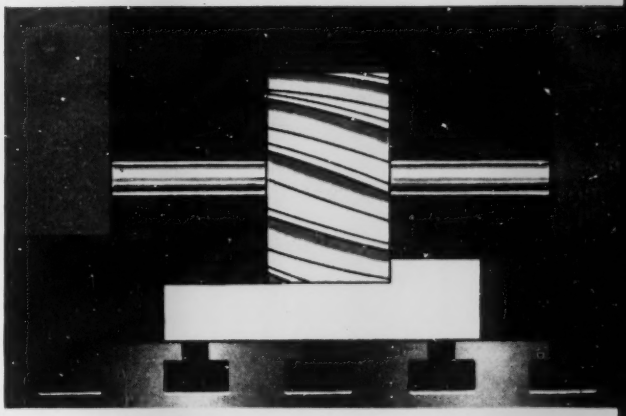
Ramtite Co. appointed **K. J. Kett-**

HOW TO END DAMAGED WAYS, PRODUCTION LOSSES

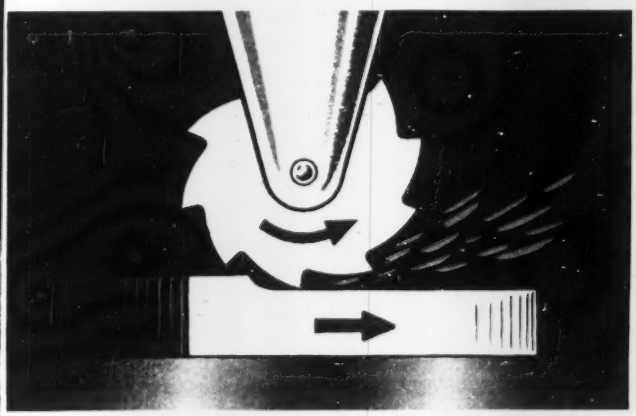
Sunoco Way Lubricant Stops "Jumpy Table"



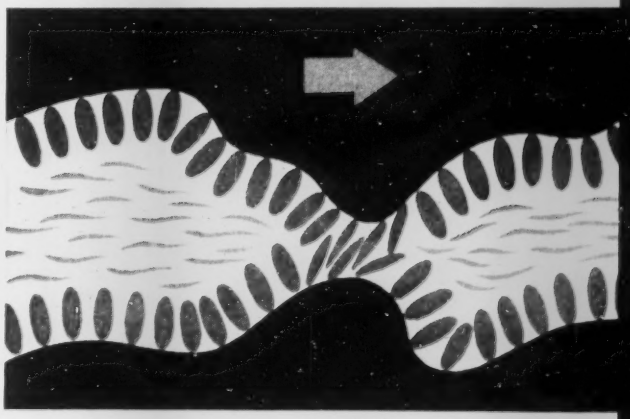
Tool chatter and jumpy table are machining headaches. Too often they cause poor surface finish, failure to hold tolerances, production losses.



Tool chatter is a result of a lack of rigidity in either the machine or the set-up. It is a mechanical problem and no lubricant can lick it.



Jumpy table is a stick . . . slip . . . stick . . . slip action of the table. It is a lubrication problem. Though just as damaging as tool chatter, it is not always detected when the cause of poor surface finishes.



Extreme magnification

Sunoco Way Lubricant cures jumpy table. It contains special compounds that form a film, like the nap of a rug, on the sliding surfaces and minimize the force of both static and kinetic friction.

Why take a chance of damaging your ways? These integral parts of the base casting for your machine are difficult to refinish and costly to replace. For information about Sunoco Way Lubricant, call a Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-10.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

SUNOCO

PHILADELPHIA 3, PA. ◆ SUN OIL COMPANY LTD., TORONTO & MONTREAL

LEWIS D. FYKSE
. . . v. p.-sales, Cleveland Hardware

NORMAN R. GREMORE
. . . Congress Die Casting sales mgr.

A. V. McMURRAY
. . . promotion at Master Tank & Welding

ner district manager, northeastern Ohio. He has headquarters in Youngstown.

Lewis D. Fykse was elected vice president in charge of sales of **Cleveland Hardware & Forging Co.'s** forging, diecasting and truck and body hardware divisions. He goes to Cleveland Hardware from Standard Tool Co. of Cleveland, where he was vice president in charge of engineering for the last four years and prior to that sales service engineering manager.

T. E. Alwyn, vice president at **American Can Co.** and formerly in charge of sales, was elevated to the firm's executive department, concerned with over-all administration of the company. **D. B. Craver**, general manager of sales, was elected vice president-sales. They will both continue headquarters in New York.

Robert R. Sheffer is regional sales manager to cover Ohio, West Virginia, Michigan, western Pennsylvania and western New York territory for **Galion Allsteel Body Co.** His headquarters are in Galion, O.

Norman R. Gremore was appointed sales manager, Tann Corp.'s **Congress Die Casting Division**, Detroit. His previous experience includes 17 years with Ford Motor Co. His most recent position was manager of the expediting section of the Ford Division purchasing office.

Paul J. Hildebrand was appointed representative for **Voi-Shan Mfg. Co. Inc.**, Culver City, Calif. **Walter Hargesheimer** will represent the company in northern California.

Elbert G. Bellows was appointed assistant vice president of **W. L. Maxson Corp.**, New York.

Shell Chemical Corp., New York, appointed **Cecil W. Humphreys** vice president in charge of manufacturing. He has previously been general manager and manager of development for the firm's manufacturing department.

Neptune Meter Co. appointed **William P. Haendel** district sales manager, Chicago area.

C. J. Hogan was made assistant sales manager, **Miller Electric Mfg. Co.**, Appleton, Wis.

A. V. McMurray, in the sales department, pipe division, **Master Tank & Welding**, Dallas, was promoted to general sales manager of the firm.

Joseph J. Moore joins **Viking Steel Co.**, Cleveland, as manager of stainless steel sales. He was formerly sales representative for G. O. Carlson Inc. in the northern Ohio territory.

Dan W. Gartner was made production manager at **Columbian Vise & Mfg. Co.**, Cleveland. He was plant superintendent of Weatherproof Co.

Alvin G. Leighton was appointed general sales manager, **Croft Steel Products Inc.**, Jamestown, N. Y., and subsidiary companies.

Homer J. Wood retired as assistant chief engineer in charge of turbomachinery for **AiResearch Mfg. Co.**, Los Angeles, division of Garrett Corp.

Nox-Rust Chemical Corp., Chicago, appointed **R. Louis Ware** as head of its newly formed industrial sound-deadener division.

OBITUARIES . . .

Herbert D. Tietz, sales manager, **Inco Nickel Alloys Department**, International Nickel Co., New York, died Oct. 10.

Percy B. Robberson, 59, secretary-treasurer, **Robberson Steel Co.**, Oklahoma City, Okla., died Oct. 12.

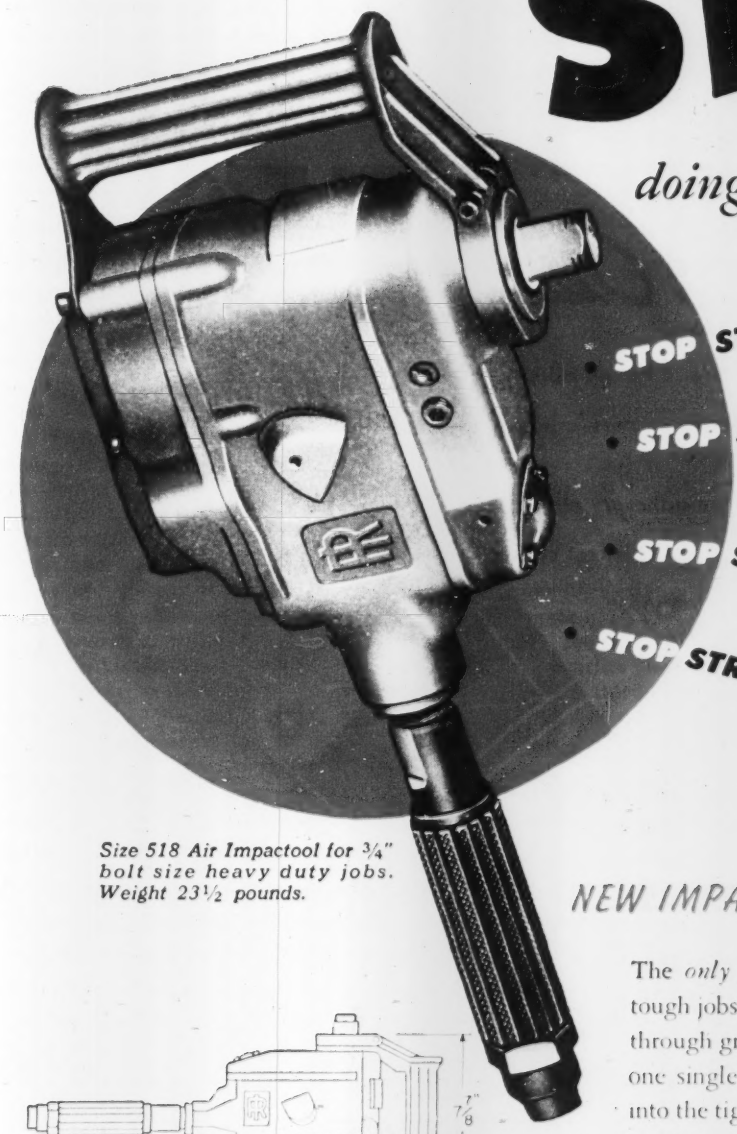
Ora C. Cox, 65, sales manager, Union Division, **Clayton Mark & Co.**, Evanston, Ill., died Oct. 12.

Joseph C. Wray, former general manager and vice president, **J. & R. Weir Ltd.**, Montreal, Que., died Oct. 7.

Frank J. West, 47, works industrial engineer for the sheet and tin mills, U. S. Steel Corp.'s **Tennessee Coal & Iron Division**, Birmingham, died Oct. 12.

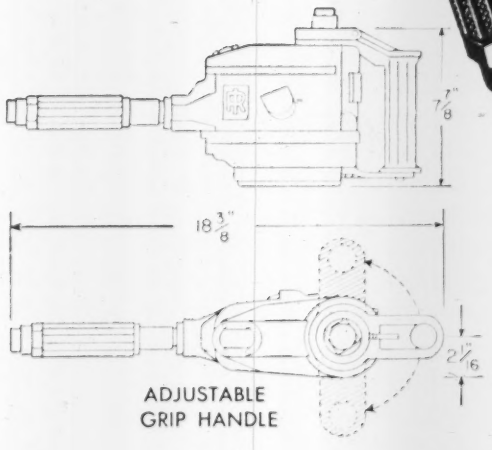
stop

doing these jobs by hand!



- **STOP STRAINING** on those nuts on high pressure pipe flange jobs.
- **STOP SLUGGING** nuts when repairing steel mill blast furnace gate valves.
- **STOP SWEATING** over those nuts when replacing trays in refinery bubble towers.
- **STOP STRUGGLING** to remove connecting rod bearing cap nuts and oil pan nuts on Diesel locomotives.

Size 518 Air Impactool for ¾" bolt size heavy duty jobs. Weight 23½ pounds.



NEW IMPACTOOL makes tough jobs easy!

The *only* power tool that can be used to do these tough jobs is the new Size 518 Air Impactool. Savings, through greatly reduced downtime, often pay for it on one single maintenance job! The 518 Impactool fits into the tightest places, quickly applies or removes the toughest nuts, with no kick or twist to the operator.

This new Air Impactool is one more addition to a famous line—the world's most complete, versatile, and dependable group of Impactools. Fourteen sizes of Air Impactools for nut running capacities from 7/32" to 4" bolt size.

Ingersoll-Rand

11 Broadway, New York 4, N. Y.

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ORIGINATOR OF IMPACTOOLS • AIR AND ELECTRIC

Remove Grease and Grime in Seconds with ENTHONE *Emulsion Cleaner* 75

Heavy oil films and solid dirt are removed from steel almost instantly.

Tapped holes, slots, embossments, corners, crevices, sculptured patterns are completely cleaned.

Insures smoother, brighter, more adherent electrodeposits.

Used before phosphate coatings it minimizes coarse coatings.

Safe for operators, does not irritate nose, throat or skin.

Requires no heating facilities.

Write for fully descriptive literature.

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INCORPORATED
442 ELM STREET
NEW HAVEN, CONNECTICUT

METAL FINISHING PROCESSES

ELECTROPLATING CHEMICALS

Die Shop Opened in East

New facility will help meet growing demand for aluminum, titanium and steel forgings

A DIE SHOP, designed to help meet the aircraft industry's growing demand for aluminum, titanium and alloy steel forgings, has been completed by Consolidated Industries Inc., West Cheshire, Conn.

This shop provides about 4100 sq ft of additional floor space that will be devoted entirely to the production of special dies made to forge parts to customers' specifications. This space is occupied now by 11 die sinking machines. It is expected that more automatically controlled machines will be added in the near future.

Overhead Busway—An interesting feature of this installation is the use of overhead busway manufactured by Trumbull Electric Department, General Electric Co., Plainville, Conn. Electrical connections are quickly made at any desired point, allowing the machines to be moved at will.

Consolidated is especially well known as a pioneer in the forging of titanium, the light metal just coming into general use in jet engines and the structural parts of planes subjected to extended exposure to heat and the elements.

Ex-Cell-O Forms Subsidiary

Ex-Cell-O Corp., Detroit, organized a wholly owned subsidiary, Ex-Cell-O Corp. of Canada Ltd., which will acquire all of the assets, except cash, of Henry Power Tools Ltd. and Craftools Ltd., both of London, Ont. The transfer will be effective Nov. 1.

At present, Henry Power Tools and Craftools are engaged in light and medium-heavy machining work, miscellaneous jobbing, foundry work and in the production of home workshop power tools. Ex-Cell-O of Canada will continue the present operations except the power tool business which has been sold to Strongridge Ltd., London, Ont.

It is expected that the London plant will start producing soon some of the standard Ex-Cell-O products, such as drill jig bushings and railroad pins and bushings. In the future the list of standard Ex-Cell-O products manufactured in Canada will be expanded.

Baker-Raulang Names Agents

Baker-Raulang Co., Cleveland, appointed as representatives for its industrial trucks and cranes in their respective territories: A. & W. Engineering Co., Miami, Fla.; Chapman Machinery Co., Tampa, Fla.; Hohl Industrial Sales Co. Inc. (affiliated with Hohl Machine & Conveyor Co. Inc., manufacturer of all types of conveyor equipment), Buffalo; and Baker-Lull Associates, Glenside, Pa.

Plans Huge Oxygen Plant

Canadian Liquid Air Co., Montreal, Que., will design and build a huge oxygen plant for Dominion Foundries & Steel Co., Hamilton, Ont. Costing more than $1 million, the plant will supply oxygen for a new oxygen steelmaking process which Dominion will pioneer in North America.

It will be the first steel plant on the continent to use the process and only the third in the world. The plant is scheduled to be in operation by the middle of 1954.

SPS Marks 50th Anniversary

Standard Pressed Steel Co., Jenkintown, Pa., producer of socket head screws, shop equipment, dowel pins, pressure plugs, locknuts and specialty parts for the aircraft and other industries, is observing the 50th anniversary of its founding. The firm's $10-million program of expansion in machines and building construction is nearing completion.

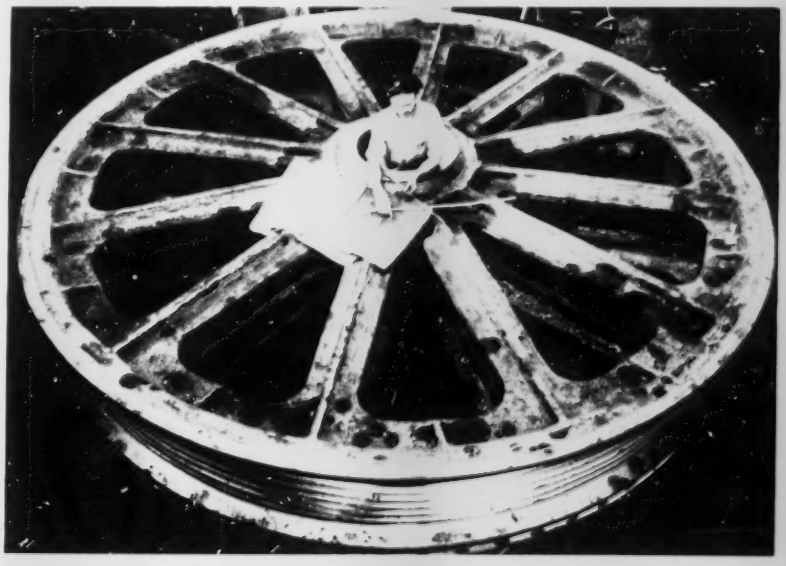
Roe Buys Jet Engine Plant

A. V. Roe Canada Ltd., Toronto, Ont., purchased the government-owned jet engine plant at Malton, Ont., in a multimillion dollar deal. The jet plant was operated by the company for the dominion government on a management-fee basis since it was opened approximately a year ago.

Dominion Bridge To Expand

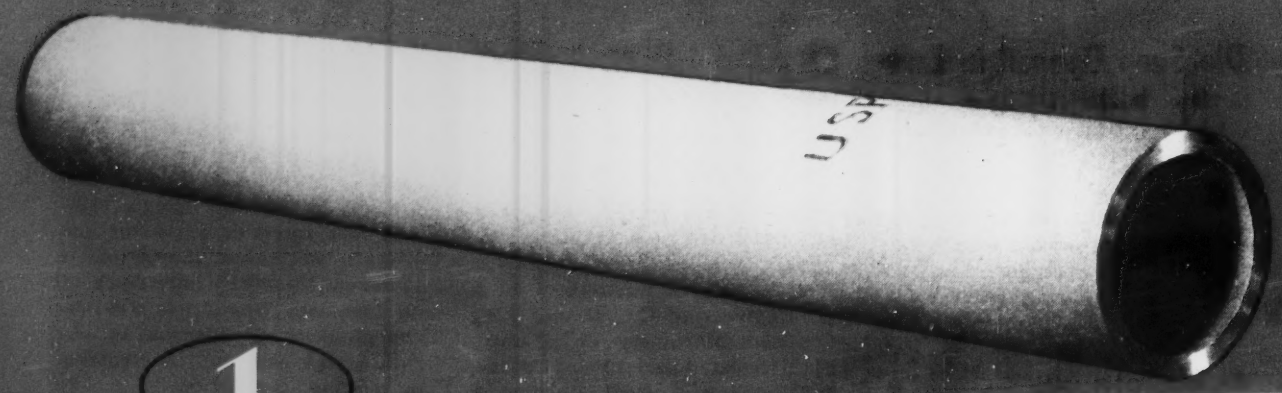
Dominion Bridge Co. Ltd., Toronto, Ont., plans a $15-million to $20-million long-term plant construction program. Construction of the first unit, costing $1 million,

(*Please Turn to Page* 102)



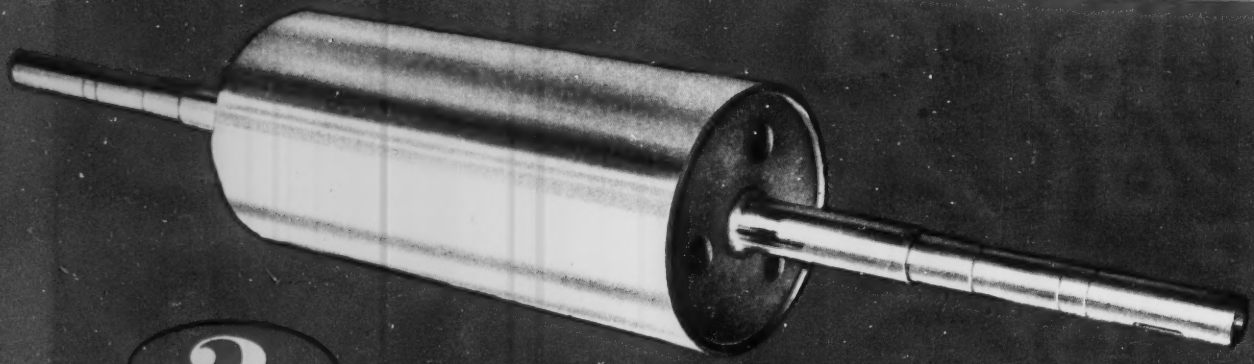
Round and Round You Go

This 31-ton wheel is largest counterweight ever machined at United States Steel Corp.'s American Bridge Division plant at Ambridge, Pa. It is one of 16 designed to carry the heavy cables which will raise and lower New York Central Railroad's new lift bridge over the Harlem river in New York city. American Bridge is fabricating more than 14,000 tons of steel for the bridge. John Hapich, a workman, is shown checking blueprint dimensions of the sheave



1

TWO SOLUTIONS TO THE CHALLENGING PROBLEMS OF



2

UNITED STATES PIPE & FOUNDRY CO.

Special Products Division

SPECIAL PRODUCTS DIVISION U S P

BURLINGTON, NEW JERSEY

SALES OFFICES: LOS ANGELES, CHICAGO, ST. LOUIS, CLEVELAND, DETROIT, PITTSBURGH, CAMBRIDGE (MASS.), BURLINGTON

HIGH TEMPERATURE

1 SOUNDNESS AT 2150° F.

Because of their inherent soundness, metal mold centrifugally cast retorts give longer operating life at extreme temperatures. These retorts have been tested in service under the most adverse operating conditions, and field performance data prove their superiority conclusively.

Centrifugally cast stainless steel retorts are used by the New England Lime Company of Canaan, Connecticut to produce high purity magnesium metal by thermal reduction. Their retorts are operated 24 hours a day at 2150° F. under a high internal vacuum – a test only the ultimate in soundness and quality could survive.

2 SURFACE AT 1400° F.

The Selas Corporation of America, one of the nation's leading industrial furnace builders, demands a high order of quality in the stainless steel rolls used in their continuous strip annealing furnaces. Perfect roll surfaces are a "must". The slightest surface imperfection in the strip will cause rejection.

Long, trouble-free life, at extreme temperatures, is assured because of the dense, flawless roll surface made possible by the metal mold centrifugal process.

In cylindrically shaped sections, U. S. Pipe offers a wide range of sizes in electric furnace alloys for many difficult and exacting applications.

"METAL MOLD" CENTRIFUGAL CASTINGS

SIZE RANGE AND COMPOSITION FLEXIBILITY

Outside Diameter	4" to 30"
Wall Thickness	3/8" and up
Length	Up to 14' in the "as-cast" condition
Type of Stainless Cast	All Standard AISI and ACI grades of ferritic and austenitic stainless plus "Special" types

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Champion?

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When you select an industrial contractor, you want a responsible organization coached by keen, aggressive executives and manned by an experienced staff which displays ingenuity, as well as skill and teamwork.

The Commercial Contracting Corporation team is proud of its qualifications and accomplishments—of its reputation for doing quality work quickly and economically.

Whether a project is large or small, every aspect of the work is carefully planned in advance. Every operation is supervised by experts, expedited by top management.

Just as any good football squad welcomes a chance to compete, so this seasoned industrial team welcomes the opportunity to bid on any project involving one or more of the many CCC services.

CCC services, provided individually or under one PACKAGE contract, include:

• General Construction • Building Alterations • Demolition • Foundations • Press Erecting • Machinery Moving • Crane and Conveyor Installing • Equipment Warehousing • Steel Fabricating • Export Packaging •

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(Concluded from Page 99)

will begin soon and will be in operation in 1954 to produce water pipe and miscellaneous light plate work now fabricated at the Shaw street plant.

Pittsburgh Gear Moving

Brad Foote Gear Works Inc., Cicero, Ill., purchased larger quarters on Neville Island, Pa., for its subsidiary, Pittsburgh Gear Co., which will make a wider range of types and sizes of gears in addition to its present line of steel mill and coal mining machine gears and parts. Machine tools and equipment are being moved from the old plant in Pittsburgh to the new location as rapidly as new foundations are prepared. About 50 new automatic gear cutting and hobbing machines, along with heat-treating equipment, is being purchased. Gunnar E. Gunderson, president of Brad Foote, estimates that the investment will approximate $1 million, including $300,000 for buildings and land.

Warner Electric Names Agent

Warner Electric Brake & Clutch Co., Beloit, Wis., appointed George J. Fix Co., Dallas, as southwestern distributor for its Industrial Division.

Eclipse Buys Valve Division

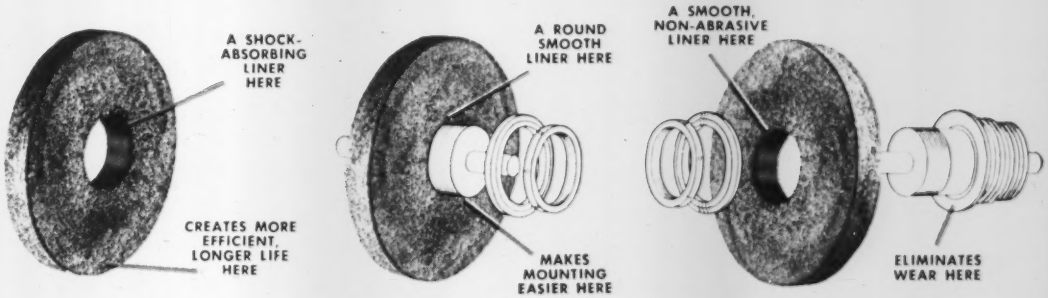
Wheaton Engineering Co., Wheaton, Ill., sold its Solenoid Valve Division to Eclipse Fuel Engineering Co., Rockford, Ill. Purchase included complete production equipment, patents, engineering drawings, etc. Solenoid valves will be produced in the Rockford plant. Eclipse manufactures industrial furnaces, gas and oil burners, process steam boilers, vaporizers, combustion equipment, meter bars and gas distribution specialties.

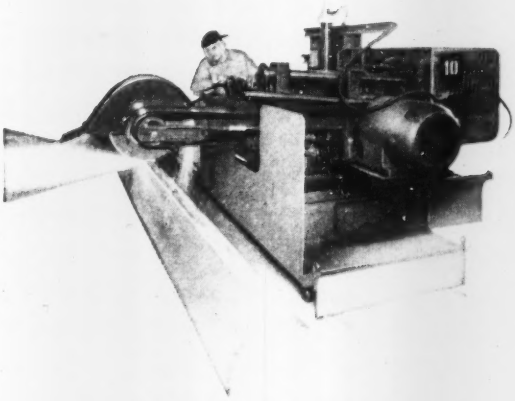
Screw Firm Expands Facilities

Safety Socket Screw Co., Chicago, completed a new unit to its plant facilities that increases the firm's capacity by more than 25 per cent. The company makes socket cap and set screws, pipe plugs, socket head stripper bolts and flat-head socket cap screws.

For rugged conditioning jobs you can't beat...

MID-WEST FIBER-CUSHIONED SNAGGING WHEELS

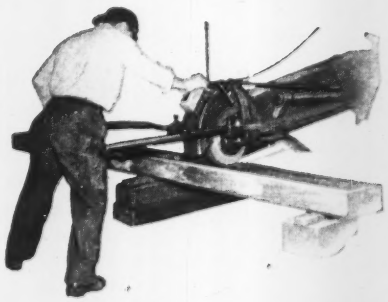

A SHOCK-ABSORBING LINER HERE
CREATES MORE EFFICIENT, LONGER LIFE HERE
A ROUND SMOOTH LINER HERE
MAKES MOUNTING EASIER HERE
A SMOOTH, NON-ABRASIVE LINER HERE
ELIMINATES WEAR HERE



Whether you use MID-WEST'S new automatic grinders, or hand-operated swing-frame grinders...

- **Mid-West snagging wheels are easier to mount!**
- **Their greater efficiency cuts grinding costs!**
- **And they're easier on your operator!**

Mid-West designed fiber-cushioned centers, plus Mid-West's special resinoid bond—an extremely tough, tenacious bond—assure increased production and lower grinding costs per ton! For complete information regarding fiber-cushioned snagging wheels—write, wire or phone today.



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How to get welds
with **high fatigue strength**

To get the least weight per horsepower in diesel locomotives calls for the light weight and strength of low alloy-high tensile steels. Welded fabrication of this steel demands joints that possess high fatigue strength to resist the pounding and vibration of steady operation.

The rigid quality controls of Arcos Low Hydrogen Electrodes that assure the locomotive builder the needed weld metal physicals, give you the same assurance of consistently high physicals on *any* low alloy-high tensile welding job. *Regardless of the nature or requirements of the job,* when you specify Arcos Low Hydrogen Electrodes you'll get the results you want . . . plus the added saving of time, in many cases, of being able to eliminate preheat and to weld in all positions with one electrode.

ARCOS GRADE	A. W. S. SPEC.
Tensilend 70	E7016
Tensilend 100	E10016
Tensilend 120	E12015
Manganend 1M	E9015
Manganend 2M	E10015
Nickend 2	E8015
Chromend 1M	E8015
Chromend 2M	E9015

ARCOS CORPORATION
1500 S. 50th Street, Philadelphia 43, Penna.

WELD WITH ARCOS
LOW HYDROGEN ELECTRODES

Power Company Organized

Buys transmission and distribution facilities of Cliffs Power & Light Co.

WITH DEVELOPMENT and beneficiation of low grade iron ore mining which Cleveland-Cliffs Iron Co., Cleveland, is undertaking in the Humboldt and Republic areas, together with increased mining operations, use of power in Michigan's Upper Peninsula territory is expected to be more than doubled during the next few years.

Upper Peninsula Power Co., Houghton, Mich., is taking over the transmission and distribution facilities of Cliffs Power & Light Co., Ishpeming, Mich., a subsidiary of Cleveland-Cliffs. Upper Peninsula Power will supply electric energy to customers formerly served by Cliffs Power. These customers are the iron mines, other than Cleveland-Cliffs Iron Co.'s mines, and other customers in the vicinity of Ishpeming, Negaunee, Munising, Mich., and Inland Lime & Stone Co.'s quarry near Blaney, Mich. Upper Peninsula Power will transmit power from Cliffs Power Co.'s plant to the operations of Cleveland-Cliffs Iron Co.

To Build Plant—Through formation of Upper Peninsula Generating Co., the two utilities (Upper Peninsula Power Co. and Cliffs Power Co.) jointly will own and construct a lakeside steam generating plant, the tentative location being in the Marquette area.

Upper Peninsula Power Co. will build a transmission line from Humboldt to Atlantic, Mich., which will interconnect its present system with that of the system to be acquired from Cliffs Power.

Nonferrous Metal Firms Unite

R. Lavin & Sons Inc. completed arrangements for the absorption of L. A. Cohn & Bro. Inc., both of Chicago. These firms are nonferrous metal smelters and refiners. Lavin purchases all of the inventory and all physical effects of Cohn, exclusive of the real estate.

Max S. Cohn and Marvin M. Cohn will become affiliated with the Lavin organization.

R. Lavin & Sons Inc. will con-

tinue to operate its Chicago and North Chicago plants and at present is negotiating for a plant at an undisclosed location in the East.

Just the Facts, Ma'am

A NEW kind of "truth machine" is being used to get confessions from big wheels that refuse to go straight. Grinding wheels, that is.

Engineers for Electro Refractories & Abrasives Corp., Buffalo, invented a machine that enables inspectors to tell positively if grinding wheels are "true." Deviations which are imperceptible to the eye are instantly spotted by dial indicators that measure the margin of error in thousandths of an inch.

Wheels off more than 0.008 in., at revolving speeds upwards of a mile a minute, are rejected.

Frontier Buys Pulsolator

Frontier Industries Inc., Buffalo, acquired the Pulsolator Division of Rivett Lathe & Grinder Co. Inc., Brighton, Mass. Purchase included tools, machinery, patents and the product, a lubricator used by the machine tool industry. Machinery and manufacturing operations will be moved to the Buffalo plant of Frontier Industries' Manzel Division.

Acme Welding Names Agent

Acme Welding Division, United Tool & Die Co., West Hartford, Conn., fabricator of steel weldments, appointed as its exclusive sales representative in Canada and the United States, excepting New England, Transmission Equipment Co. Inc., New York, an engineering firm specializing in heavy machinery.

Bustin Moves to Dover, N. J.

Bustin Steel Products Inc., New York, manufacturer of truck and trailer equipment, and Bustin Firm-Grip Grating Corp., manufacturer of safety gratings, moved

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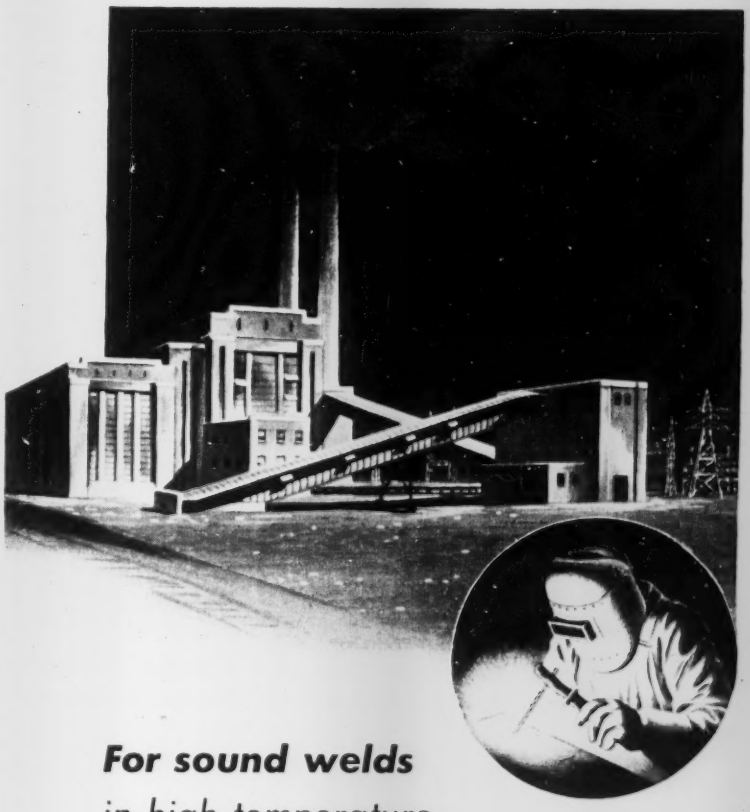


For sound welds
in high temperature,
high pressure service...

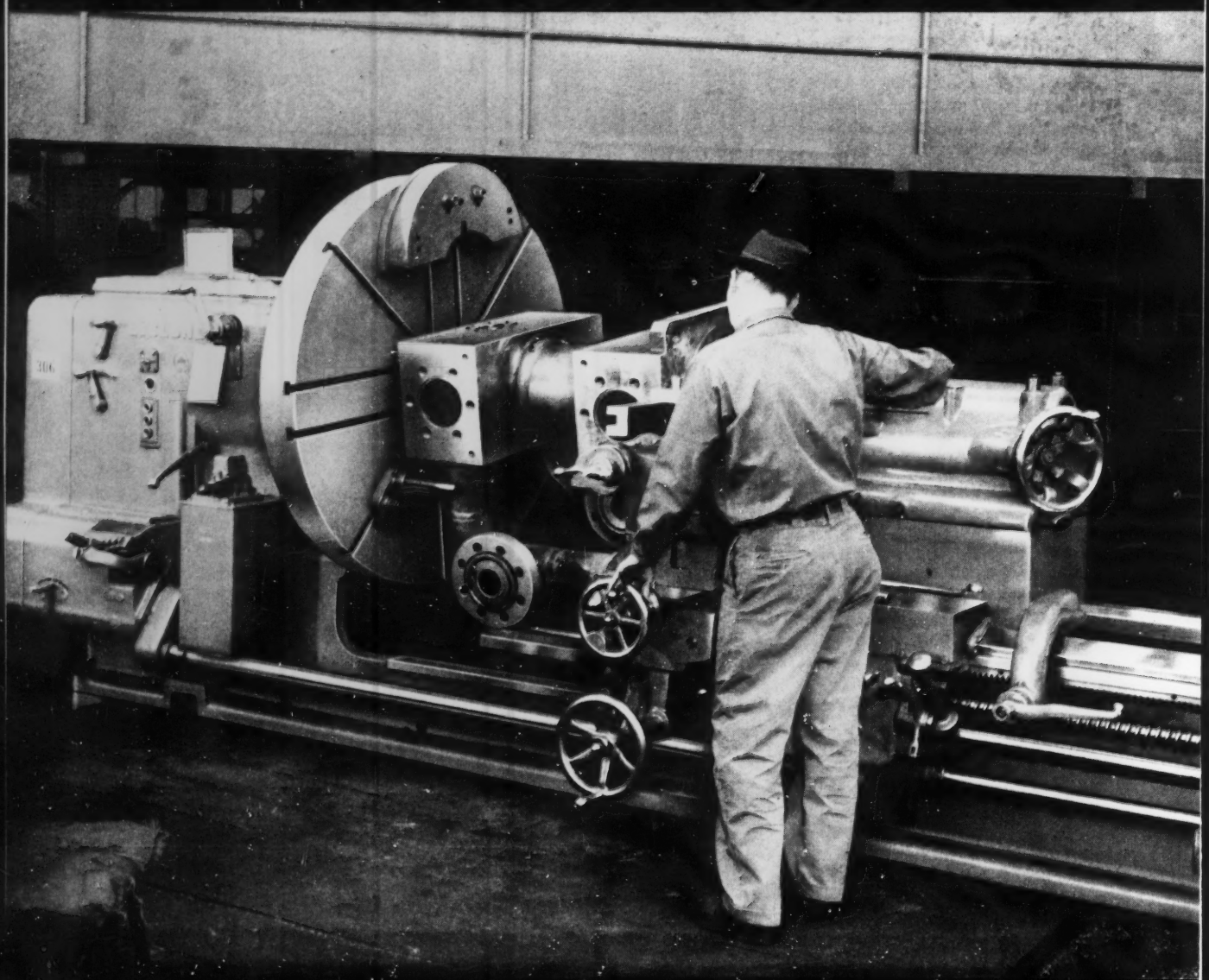
When you have a welding job that calls for weld metal of high strength with excellent properties at elevated temperatures, you can trust ARCOS STAINLESS ELECTRODES to give you the results you want.

Whatever the requirements, Arcos Stainless Electrodes provide a wise investment in time and money. From the extensive line of Arcos electrodes, you can choose the electrode to produce a weld with required physical, chemical, or metallurgical properties to stand up in service. Get your free copy of "What Electrode Would You Use?" Write today!

ARCOS CORPORATION, 1500 South 50th Street Philadelphia 43, Pennsylvania

WELD WITH ARCOS STAINLESS ELECTRODES

Le Blond Gap Lathe stars in 16-hour Variety



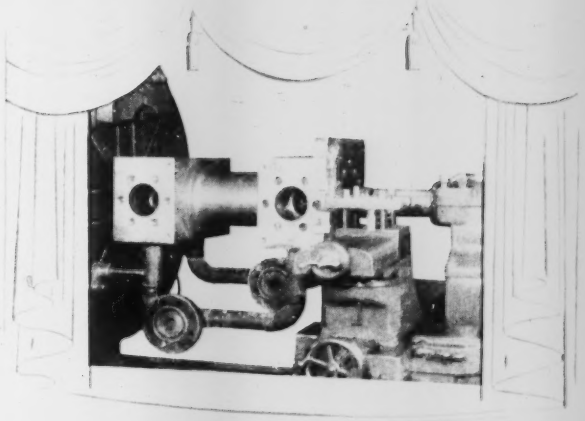
In operation shown, LeBlond 32"/60" Sliding Bed Gap Lathe is used to finish faces of compressor cylinder. Faces must be made parallel, square to bore. Extending manifolds require 78" swing. Job is supported on plug centers, weighs about 3 tons. Spindle speed, 76 rpm; feed, .010; 2 cuts; job time, approximately 110 minutes.

Show at Clark Brothers

Juggles Diameters From 6" to 78"

. . . Satisfies Critics

with Stellar Performance!



Clark Brothers Company, Olean, New York, had to "book" a one-lathe act—a single machine to turn out a wide variety of components for "Big-Inch" Type compressors. A special lathe for occasional large-diameter work was too costly.

"Talent scouts" at LeBlond's Buffalo distributor, The Buffalo Machinery Co., recommended their hottest variety number—a LeBlond 32" /60" Sliding Bed Gap Lathe.

Now this versatile machine performs 16-hours-a-day at Clark Brothers, takes the place of at least two machines. One specialty is truing-up and finishing heat-distorted compressor cylinders with manifolds already welded in place—faces must be made parallel. The sliding bed of the LeBlond Gap lathe opens up readily to meet the *78" swing requirement.*

With gap closed, it operates as a standard heavy duty engine lathe, turns power cylinders and cylinder liners *ranging from 6" to 30" diameters, requiring tolerances of ± .0015".*

The multi-purpose LeBlond Sliding Bed Gap Lathe is a sweetheart in the shop. Has adjustable gap and center distance. Four-way rapid traverse. Thirty-six spindle speeds are available, 5 to 500 rpm. Sixty feeds and threads. And, of course, you get all the well-known LeBlond features—hardened and ground steel bed ways, totally enclosed quick-change box, automatic lubrication, one-piece apron, thrust-lock tailstock and many more.

Whether your turning jobs call for versatility or production, heavy hogging or fine finishing, there's a LeBlond Lathe to turn them better, faster. Your LeBlond Distributor will tell you about the three Sliding Bed Gap Lathes, 16"/38", 25"/50", and 32"/60". Call him or write The R. K. LeBlond Machine Tool Company, Cincinnati 8, Ohio.

Ask for Bulletin SBG-103A for more information on LeBlond Sliding Bed Gap Lathes.

Cut with Confidence

LeBLOND of Cincinnati

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO

WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • *FOR MORE THAN 66 YEARS*

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Better, cheaper, faster radiographic testing is a product of trained personnel plus proper equipment.

The new Westinghouse Industrial Supplies and Accessories Catalog has 44 pages listing over 600 items of film, chemicals, equipment, tools, and devices. The advantages and uses of each product are carefully explained.

In initiating, expanding, or refurbishing your radiographic program, call your nearest Westinghouse X-ray office (listed in the catalog or your phone book). There you will find men of wide experience who can help you toward an efficient, modestly priced arrangement.

Use the coupon or call your Westinghouse X-ray representative for a copy. It means faster, cheaper, better radiographs.

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Please send me a copy of the new booklet "Industrial X-ray Supplies and Accessories."

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(*Concluded from Page* 105)

to the first section of their new plant in Dover, N. J. The plant is equipped with a newly developed type of multispindle resistant welder, built by Thomson Electric Welder Co., Lynn, Mass.

General Bronze Buys Halback

General Bronze Corp., Garden City, Long Island, N. Y., acquired C. E. Halback & Co., Brooklyn, N. Y., fabricators of metals for building construction. Walter Nelson, president of the Halback firm, will be named a vice president of General Bronze. Among the Halback projects is the Woolworth building and the Empire State building. This firm furnished materials for the former and did most of the metal work on and supplied the tower for the latter.

Reynolds Metals Names Agents

Reynolds Metals Co., Louisville, appointed as its distributors: Pennsylvania Industrial Supplies Co. Inc., Pittsburgh; Ontario Metal Supply Co. Inc., Rochester, N. Y. The two firms will carry stocks of specialty aluminum wire, rod and bar (screw machine stock) products.

Rudel Heads Association

American Machine Tool Distributors Association, Philadelphia, elected Thomas R. Rudel, president of Rudel Machinery Co. Inc., New York, president of the association. Other association officers are: R. A. Vidinghoff of Machinery Associates Inc., Wynnewood, Pa., first vice president; H. R. Hanson of Wm. K. Stamets Co., Cleveland, second vice president; J. F. Owens Jr. of J. F. Owens Machinery Co., Syracuse, N. Y., secretary-treasurer.

Establishes New Scholarship

Chicago chapter of American Materials Handling Society established at the Illinois Institute of Technology, Chicago, the country's first scholarship in the field of materials handling. Joseph Bragen, an industrial engineering student, was granted the initial $650 full-tuition scholarship.

USE
HOUGHTON
RUST VETO

HIGH FLASH POINT RUST PREVENTIVE

Among the wide range of RUST VETO corrosion preventives are several developed especially to provide extra safety in plants where fire hazards exist. We offer particularly RUST VETO 267, a polar-type, water-displacing compound with minimum flash of 150° F. It provides a soft film .00034" thick, and may be used for between-operations slushing, or for temporary indoor storage or shipping. Fingerprint neutralizer type also available.

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HOUGHTO-SAFE

NON-FLAMMABLE HYDRAULIC FLUID

Perfected after more than five years of research and field testing, Houghto-Safe safeguards both men and machines. This new hydraulic fluid won't burn or explode—is rated "acceptable from the fire hazard standpoint" by Factory Mutual. Houghto-Safe is also non-toxic, and is fortified to prevent corrosion or undue wear. Its high lubricity, oxidation resistance and high viscosity index keep machines safe as well. Houghto-Safe is really *safe* from every standpoint. Write for new descriptive bulletin.

USE
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"COLD CLEANER"

WATER-SOLUBLE CLEANER

No need to use open solvent tank; here is a water solution of room-temperature cleaner with speedy wetting action, to remove shop soil by spray or washer. Houghto-Clean 445 leaves a slight film to protect temporarily against corrosion. Write for Data Sheet.

USE
HOUGHTON
ANTISEP

WATER-SOLUBLE, ALL-PURPOSE CUTTING BASE

Effective for over 90% of all machining operations, Antisep also keeps personnel and equipment safe from fire and explosion. Antisep is a heavy-duty fortified cutting base that is soluble in water. Antisep A. P. Base offers no target to catch fire or start a blaze. Moreover, even in 30-to-1 dilutions, it provides lubricity, film strength, antiwelding and antiseptic properties not found in oil-mixed bases much higher in cost. A test will convince you.

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For SAFETY specify these products by

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PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

Machine Tool Sales Hold

Giddings & Lewis officials anticipate good domestic and foreign business

EXECUTIVES of Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., expressed optimism over prospects for machine tool business both in this country and abroad at a 4-day open house for 1100 industrialists, customers, dealers and financiers.

Ralph J. Kraut, president and general manager, said that subcontract work farmed out to other companies will be completed early in 1954, but present unfilled orders amount to a year's output for the Fond du Lac plant, and new business is holding up well. Subcontract work, undertaken to meet more urgent and critical defense needs, has amounted to about one-third of total output. This type of business is not profitable, Mr. Kraut said, and the company will be pleased to return to the more normal situation of production solely out of the Fond du Lac plant.

Foreign Trade—Just returned from Europe, D. M. Laflin, vice president in charge of sales, said outlook abroad is more promising, especially in England, France, Italy, Switzerland and the low countries, and that there is a good chance before long that foreign business will get back to a more normal 25 per cent of total sales. Competition of imported foreign tools into the U. S. is diminishing, he said.

G&L's program of expansion, largely completed in 1952, has increased capacity by one-third. In 1948, G & L took over the Cincinnati Planer Co. Operations were moved to Fond du Lac in 1950 and its planer line now is sold under the G & L label. Davis Boring Tool Co., St. Louis, purchased in 1945, is operated as a separate division and housed in a plant in Fond du Lac acquired in 1951.

Cleveland Tapping Buys Drill

Cleveland Tapping Machine Co., subsidiary of Automatic Steel Products Inc., Canton, O., purchased from Munding Machine Co., Glendale, Calif., all manufacturing rights for the Munding bench radial drill. The drill, to be known as the Cleveland-Munding bench radial drill, is now available for delivery from Cleveland Tapping Machine Co.

Solar Moves Up Plant Opening

Stanford J. Friedman, vice president of Solar Steel Corp.'s southern operations, announced that the firm's 60,000-sq-ft plant on Reading road in Sharonville, O., will be opened formally on Nov. 9 instead of in December as previously announced. Solar Steel Corp., Cleveland, also is erecting a warehouse in Nashville, Tenn. These two plants, plus other Solar plants now in operation or in process of construction, will add up to a total of 11 which specialize in stocking flat-rolled products of all kinds, bar and tube steel products, tool steel, alloy steels, maintenance steels and drill rod. Solar also provides processing services.

Machinery Firms May Merge

Columbia Machinery & Engineering Corp., Hamilton, O., is negotiating for a merger with Lodge & Shipley Co., Cincinnati. Details of the proposed merger of these machine tool manufacturers will be sent to Columbia stockholders in November.

Valvemaker Consolidates

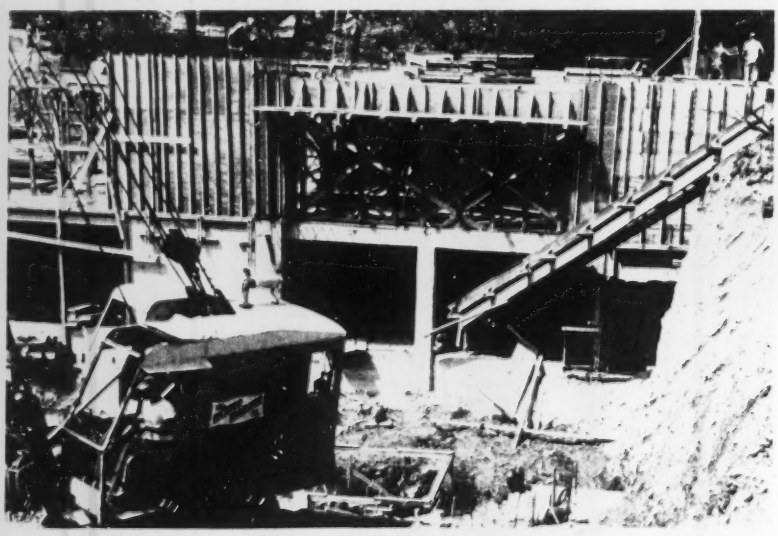
S. Morgan Smith Co., York, Pa., manufacturer of turbines and valves, merged with its wholly owned subsidiary, R-S Products Corp., Philadelphia. All sales and engineering functions have been moved to York and are being combined with the present Valve Division. The company will continue to manufacture valves at the Philadelphia plant. Carl J. Wilcox will serve as sales manager for the consolidated Valve Division.

Scully-Jones Appoints Agents

Scully-Jones & Co., Chicago, appointed as distributors of its precision holding tools: Tool Supply & Engineering Co., Dallas; and Dolan Industrial Sales, Houston.

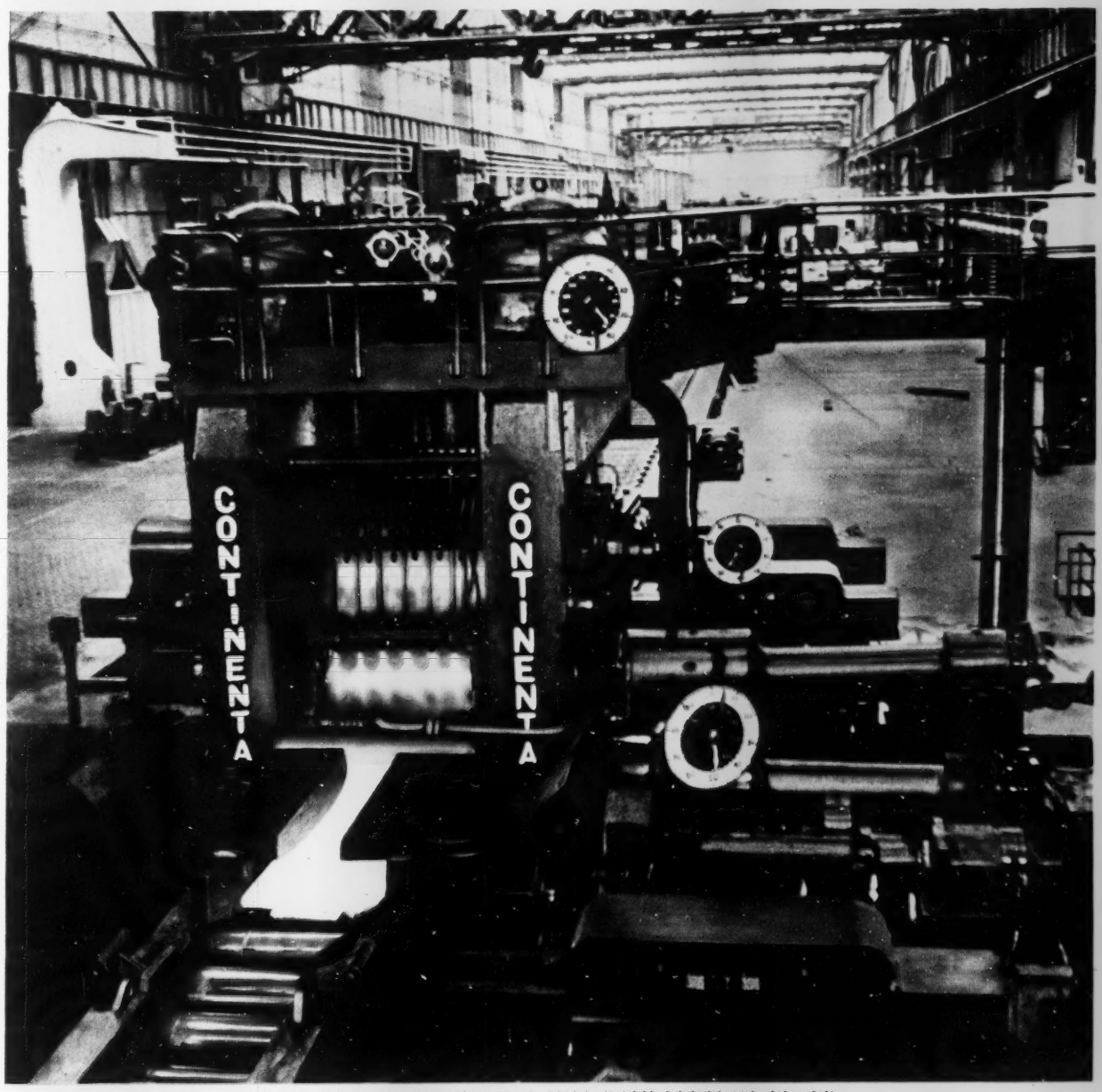
New Production Pool Formed

Another "small business" defense production pool, organized by the former Small Defense Plants Administration, and approved under the antitrust laws by the attorney general, is Federated Facilities Inc., Minneapolis, made up of these firms: Walter Haertel Co., Kausel Foundry Co. and Superior Plating Inc., Minneapolis; and Presto Mfg. Co. Inc., St. Paul.



Cincinnati Milling Building Emergency Shelters

Security areas for use by employees in the event of an emergency are being built entirely underground by Cincinnati Milling Machine Co., Cincinnati. This project is part of the firm's over-all expansion program. Construction is well advanced on a wing being added to its engineering and headquarters building under which a subbasement, shown being erected, is provided to serve as an emergency shelter



FOUR-HIGH REVERSING HOT MILL WITH VERTICAL EDGER

Complete Rolling Mill Installations

SLABBING MILLS
UNIVERSAL MILLS
PLATE MILLS
HOT STRIP MILLS
COLD STRIP MILLS
TEMPER MILLS

Mills complete with Auxiliary Equipment

* * *

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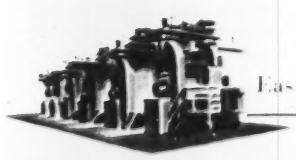
SPECIAL MACHINERY

BLOOMING MILLS
STRUCTURAL MILLS
RAIL MILLS
BILLET MILLS
ROD MILLS
MERCHANT MILLS

CASTINGS carbon and alloy steel from 20 to 250,000 pounds

ROLLS iron, alloy iron and steel rolls for all types of rolling mills

WELDMENTS fabricated steel plate, or cast-weld design.



Plants at
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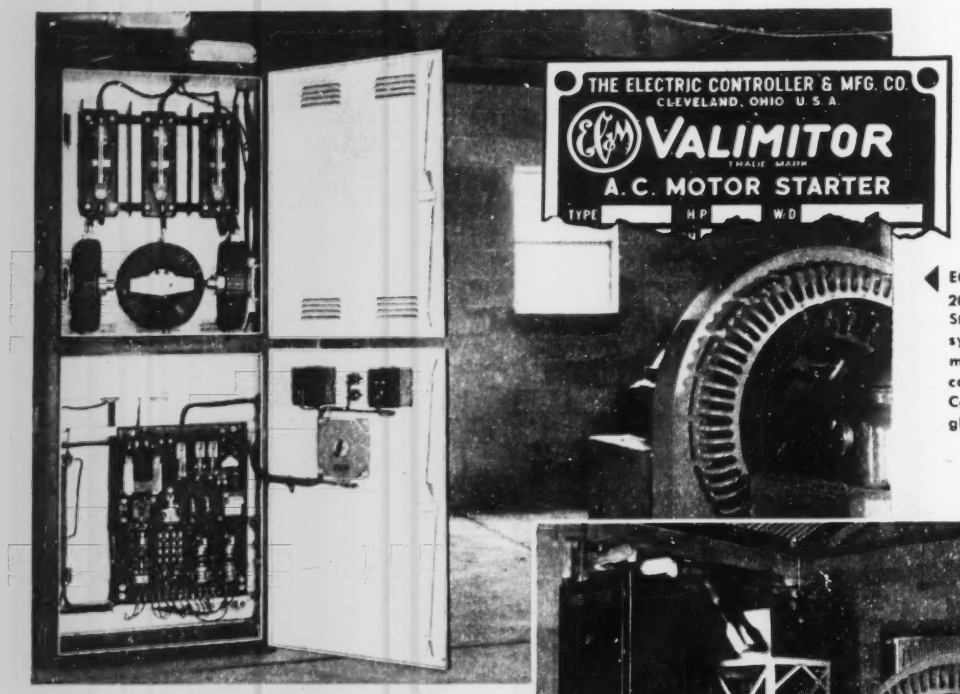
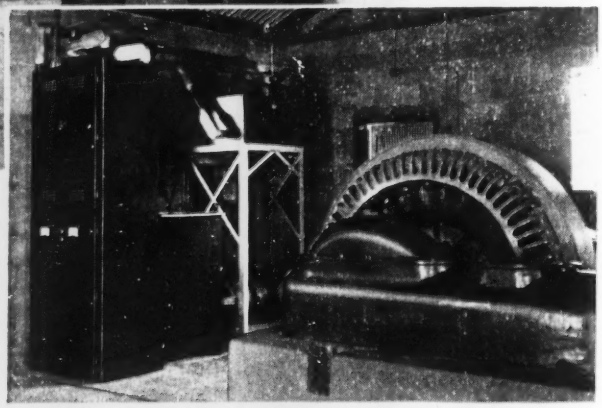
Foundry & Machine Company

4-WAY PROTECTION for "essential" drives



EC&M 4160 Volt 200 HP VALIMITOR Starter for new synchronous motor-driven air compressor in Central Ohio glass plant.



1 SHORT CIRCUIT Protection KVA availability may be infinite VALIMITOR (Volt-ampere-limitor) coils limit fault currents to 25,000 KVA. Type ZHS Contactor, with interrupting capacity of 50,000 KVA plus the d-c component, clears the circuit quickly.

2 MOTOR PROTECTED from overheating due to single phase operation or from overload when running. If motor pulls out of step and then re-accelerates the load, re-synchronization again occurs automatically.

3 UNDER VOLTAGE Protection on momentary voltage dips, time-delay keeps push button circuit "active," eliminating necessity to re-press the start button if voltage recovers in two seconds or less. Contactor held in under full contact pressure down to 25% of normal voltage, then breaks cleanly. Avoids contact sticking under weak spring pressure.

4 PERSONNEL Protection complete enclosure with hinged upper and lower doors on front cubicle. Upper compartment contains high voltage with electric door-interlock to open contactor circuit. Low voltage apparatus in lower compartment.

They couldn't afford a shut down. This essential "main-line" drive supplies air for the production of glass. Plant management found EC&M VALIMITOR Starters offered the best guarantee for continuity of service. No fuses to replace on a fault. The time-delay UVP feature was simple and the contactor held in down to a low voltage on a momentary voltage dip. The Type ZHS Contactor combined high interrupting capacity with ability to provide repetitive starts and stops with only routine inspection.

When making initial cost estimates, get the facts on EC&M High Voltage Starters. Our nearby office will be glad to supply full information on 2300-5000 volt starters which give complete protection.

write for bulletins 1062 and T9-117

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

STEEL

October 26, 1953

Technical Outlook

BLUEPRINT FOR AUTOMATION—Progress in this field will come from conveyor engineers who find ways of automatically moving materials and positioning them for processing. So Otto Svoboda, sales manager, E. W. Buschman Co. Inc., Cincinnati, recently told the ASME at Rochester, N. Y. He also advocated the simplest possible combination of mechanisms and controls in the design of automatic equipment. "If a simple electric controller or limit switch will do it," he said, "don't insist on electronics."

MAKING OVERHEAD PAY— By switching from a flame-fired batch oven to an overhead infrared installation, National Grille & Register Co., Cleveland, licked a two-way bottleneck. Five hours were cut from the usual nine needed to heat-dry 2800 units daily, and some 200 sq ft of working space was freed for storage and general purposes. Installation, which looks more like a ventilating shaft than a drying device, hangs parallel from the ceiling, some eight feet above floor level. Thirty 3-kw Chromolax units, flanking either side of the 36-foot bake tunnel, dry 700 grills and registers each hour.

ROCKET RESEARCH— Development of air-breathing, ram-jets to supplement rocket power plants can reduce size and weight of high altitude rockets of the German V-2 type by as much as one third. Prediction was made recently by John W. Luecht, general supervisor, Missile branch, Chrysler Corp., before the SAE in Los Angeles.

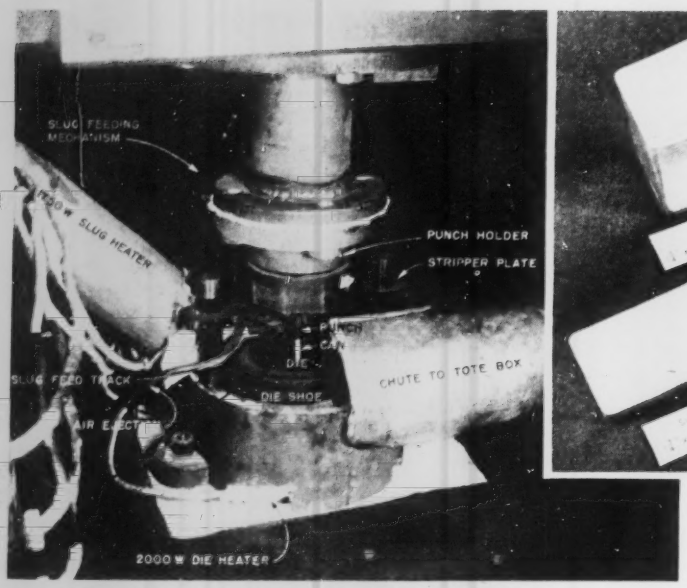
ADHESIVES—New type of adhesive product has come out of the Monsanto laboratories that promises to answer a lot of needs in industry. While the company produces only the diisocyanates that go into it, they have experimented with the polyurethane adhesive and report success in bonding steel to steel, steel to cellulose acetate, steel to acrylic resin, aluminum to cellulose, aluminum to aluminum, magnesium to aluminum, glass to glass, glass to steel. Monsanto hopes to encourage users and producers to delve further into the research. Preliminary work indicates the polyurethanes have promise in other fields: Surface coatings for metals, free films for dielectric use, resins for potting compounds.

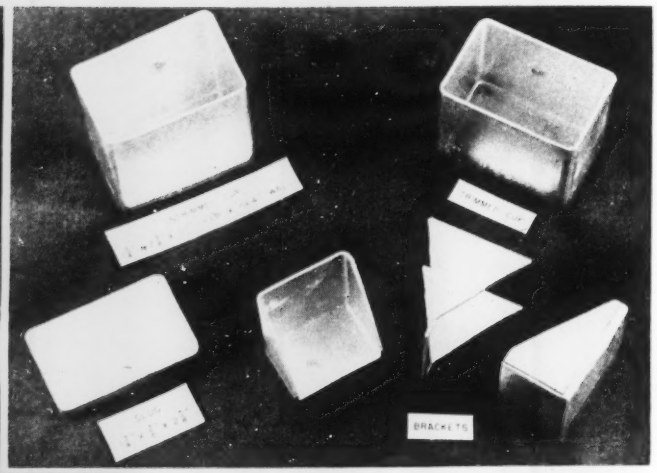
WIRE TREND?—Good sign that the Properzi continuous casting and rolling method for producing aluminum electrical wire might eventually do away with standard rolling methods came with the announcement that Alcoa has bought equipment for experimental purposes. Already used by four big wire producers in this country, system can roll 1500 pounds of redraw wire per hour. Admittedly there are still bugs to be ironed out, but Alcoa interest in this Italian equipment is considered significant.

CHROMITES—Inexpensive way of briquetting high-grade chromite now delivered as fines is being sought by the Bureau of Mines. Other work on the Bureau's research list: Production of refractories and sub-grade ferrochromium from low-grade chromite.

WHAT'S ON THE INSIDE—Very often what appears to be a time-consuming extra step in production can be a money-saver in long run. Phosphate coating before finishing steels is a good example, p. 158 . . . Anti-corrosion packaging has taken big steps with VPI paper. It's just beginning, according to the story on p. 132 . . . Look for more impact extrusion of magnesium now that the bugs have been removed and know-how accumulated, p. 114 . . . As inert gas welding grows so does the problem of gas storage. Here's a money-saving system, p. 118 . . . And machinists will praise the boring mill with underarm support for adding rigidity to operations away from central column, p. 117

Metalworking Outlook p. 63 Market Outlook p. 167





Electrically heated impact extrusion die in a vertical press equipped with slug heater, feed track, air ejector and chute to tote box. Typical products are shown at right

Metal flows at 350 to 500 F and at about half the pressure needed for aluminum. Light weight products resist corrosion and have good electrical and heat conductivity

COMMERCIAL—horizon is bright for impact extrusion of magnesium products.

Metal flows readily at moderate temperatures (usually 350 to 500 F) and at about half the pressure required for aluminum. Products, which can be handled roughly because of high rigidity, combine light weight, good electrical and heat conductivity and corrosion resistance to many organic chemicals, alkaline solutions and oils.

Applications include "cans" for certain types of dry cells, tubes for pastes, shields and covers for electronic use, hydraulic floats and small aircraft brackets.

Magnesium extrusions can be made in shapes and sizes attainable with other metals used in the process, but, of course, output is small when compared with other metals, such as aluminum, zinc and lead, which have been available longer industrially.

Process—Impact extrusions are produced by placing a slug in a die cavity and striking it a blow with a punch. Transverse sectional shape of punch determines that of the interior of the extrusion. Blow causes metal to flow (usually upward) around the punch and through the opening left between it and the die cavity.

At the end of the stroke, metal forming the bottom of the extrusion remains between the die and the end of the punch. All other metal forms the walls of the extrusion. As the punch is withdrawn, extrusion usually is lifted free of the die and is stripped from the punch during its outward stroke. Punch is a column subject to impact loading. Its diameter must be large enough to resist bending and its outer end must not deflect significantly.

Limits—Length of extrusion is usually limited to a maximum of eight diameters or somewhat less. Wall thickness must be sufficient to avoid collapsing the tube when it is stripped from the punch, but walls as thin as 0.010 inch have been produced. Thickness tolerance on side walls usually is ±10 per cent. However, closer limits may be held, especially if the punch is not too long in relation to its diameter.

Save for the fact that slugs and dies must be preheated, and other minor variations, magnesium is handled like other metals. Heating, of course, makes it possible to use less pressure and a lighter press.

Preparation—Processing of magnesium starts with preparation of slugs or blanks. They usually should make a fairly close fit in the die recess preferably about 0.010 inch smaller—to make for ready entrance and still not be off center significantly. If slug is too small and off center, walls will not be of uniform thickness.

Prepared for STEEL by Herbert Chase, consultant, Forest Hills, N. Y., from information supplied by—Dow Chemical Co., Midland, Mich.

MAGNESIUM ASSOCIATION MEETS

Ninth annual meeting of the Magnesium Association will be held Nov. 2-3 at the Biltmore hotel, New York. Program will be of interest to all fabricators and users of magnesium products.

Slugs can be sheared from rolled sheet or plate stock with a punch and die, but generally it's better to start with extruded bar stock because it costs less per pound, involves less scrap and has smoother contours and uniform diameter.

Saws — With automatic sawing setups, production can be as fast as punching. Only loss is in chips made in the cut. Saw about 0.093 inch thick can be used.

Saw equipped with pneumatic feed can cut 30 to 60 slugs a minute from a single bar. If a suitable multiple-bar setup is used, still higher rate may be attained. Saws should run at about 1500-fpm tooth speed and have a pitch of about half bar diameter.

Lubrication — Practice is to tumble slugs about 20 minutes to remove burrs and sharp edges, which may interfere with rapid feed into the extrusion die. Subsequently, a lubricant is added in a 10-minute tumbling. Graphitic dispersion, called Acheson Colloids Dag No. 41, is preferred. Little as 1 cc is enough for 100 sq in. of slug surface. Precaution: If too much lubricant is added, it may build up in dies; if there is too little, magnesium may adhere to dies and result in scored extrusions.

Uneven coatings with lubricant may cause uneven metal flow and produce variations in the thickness of walls and checks or cracks. Spraying die walls or heated slugs with graphite dispersion (thinned with 5 to 10 parts of kerosene) can be substituted for tumble coating, but process is not adaptable to rapid production. If coated slugs receive rough handling, lubricant can be baked on by heating 30 minutes at 800 F to improve adherence.

Cleaning—Slugs should not be coated unless they are free of oil and corrosion. If either is present, cleaning should precede coating. Cleaning is started with a 10-minute dip in a water solution heated to 200 F and containing, per liter: 80 grams of Na OH, 10 grams of $Na_3 PO_4 \cdot 12 H_2O$, 5 grams of Na_2SO_4 and 0.5 gram of a wetting agent, called Dupanol M.E.

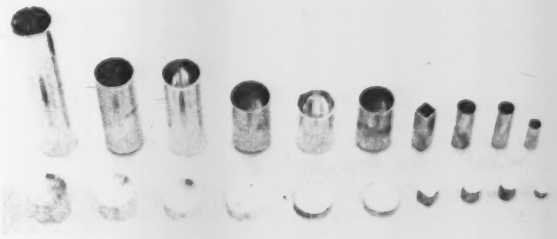
Next dip is of 1-minute duration in a bath of water containing, per liter: 180 grams of $Cr O_3$, 30 grams of $Na No_3$ and 1 gram of $Ca F_2$. Coating of slugs is preferably done just before extrusion, because, if they stand in open containers, coating gives rise to corrosion problems.

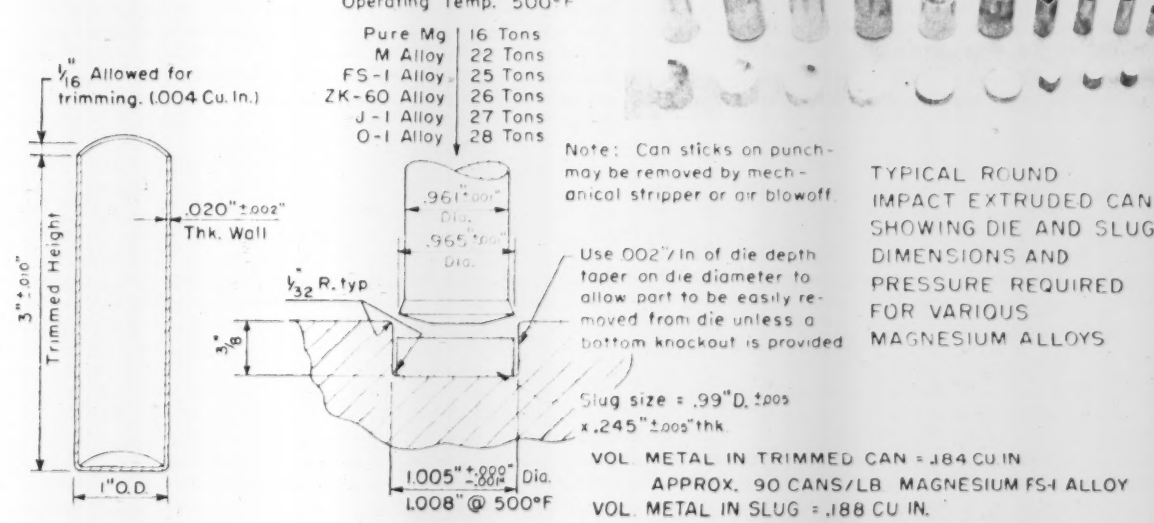
Metals — Dowmetal FS-1 has been used extensively for impact extrusions, but they can be made from commercial magnesium alloys or pure magnesium. Pressure required to extrude alloys or pure magnesium decreases as temperature increases, but is not excessive within the recommended temperature range. Alloys need more pressure than the pure metal but, of course, have greater strength.

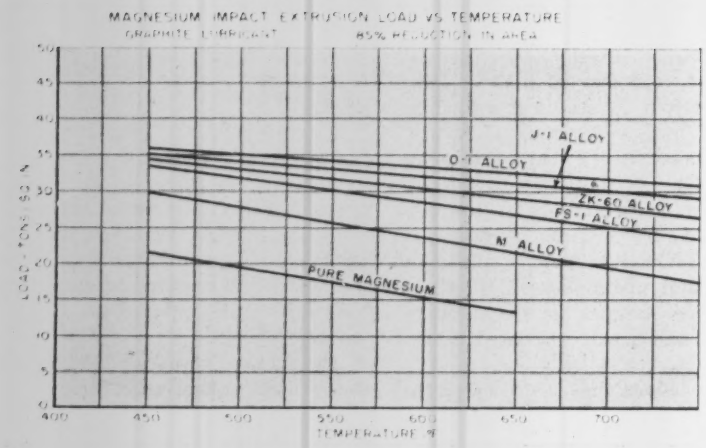
Presses—Extrusion can be done in almost any press that has load capacity and stroke long enough for the job, but presses designed especially for extrusion usually are faster. Vertical presses are commonly used in this country.

Hydraulic presses are readily adaptable to impact extrusion and

"Cans" made by impact extrusion of Dowmetal, a magnesium alloy. Slug below each can was the starting point




Pressure Req'd. At Operating Temp. 500°F
Pure Mg | 16 Tons
M Alloy | 22 Tons
FS-1 Alloy | 25 Tons
ZK-60 Alloy | 26 Tons
J-1 Alloy | 27 Tons
O-1 Alloy | 28 Tons
1/16" Allowed for trimming. (.004 Cu. In.)
3" ±.010" Trimmed Height
.020" ±.002" Thk. Wall
1" O.D.
1/32" R. typ
3/8"
.961" ±.001" Dia.
.965" ±.001" Dia.
Use .002"/in of die depth taper on die diameter to allow part to be easily removed from die unless a bottom knockout is provided
Slug size = .99" D. ±.005 x .245" ±.005" thk
1.005" +.000" -.001" Dia.
1.008" @ 500°F
Note: Can sticks on punch may be removed by mechanical stripper or air blowoff
TYPICAL ROUND IMPACT EXTRUDED CAN SHOWING DIE AND SLUG DIMENSIONS AND PRESSURE REQUIRED FOR VARIOUS MAGNESIUM ALLOYS
VOL. METAL IN TRIMMED CAN = .184 CU IN
APPROX. 90 CANS/LB MAGNESIUM FS-1 ALLOY
VOL. METAL IN SLUG = .188 CU IN.
APPROX. 89 SLUGS/LB. MAGNESIUM FS-1 ALLOY



have been used effectively. Drawback is they are often slower than mechanical, crank-operated types.

Some extrusion presses are capable of speeds up to 100 working strokes per minute but 75 strokes is fast production. Far as extrudability of magnesium is concerned, top speed is not known. Apparently, however, practical top limit depends more upon a feed mechanism that will load slugs with precision than other factors.

Preheating—Since slugs must be heated and do not remain in the die long enough to pick up sufficient heat in fast production setups, preheating is required. It also is necessary to heat the die. This can be done conveniently, as a rule, by the application of electric heating coils around the die shoe.

Heat insulation is beneficial in conservation of heat and reduction of radiation to surroundings. It is not necessary to heat the punch. It picks up sufficient heat from slugs.

Dies, Punches—Typical die for a circular impact extrusion has rounded corners at the top and bottom of the die recess. Its side walls are tapered 0.002 inch per inch of depth, so that the extrusion will not stick in the cavity. It can be lifted out on the punch when it is withdrawn. Dies without draft can be used if bottom knockouts are provided.

Punches are beveled on the bottom face next to the OD. Maximum OD, next to the end, is usually about 0.004 inch larger than the shank above. Reduced shank diameter makes stripping easier. As the punch reaches its lowest point, it forms a mating bottom in the cup or "can" produced.

When punch strikes the slug, latter is first expanded to fill the hole. Metal then extrudes upward between the punch and the die, whose radiused lower corners aid in directing the metal upward. These corners leave a corresponding outside radius on the can, where its bottom and side walls meet.

Wear — Both the end of the punch and bottom and walls of the die cavity are highly polished. Punches wear slowly at maximum OD but can be reground if a slight decrease in ID of the can is tolerated. Worn punches can be reground for use in making a cup of smaller ID.

Punch life of 200,000 extrusions is not uncommon. Braeburn steel, containing 5 per cent chromium, 1.5 per cent molybdenum, 1.25 per cent vanadium, 1.0 per cent silicon and 0.35 per cent carbon, hardened to 55-60 Rc, is preferred for production die and punch construction, but other tool steel can be used, especially for short run work.

Heating Slugs—To heat slugs, they are placed on a feed track and transported through an inclined Alundum tube that is wound with an electric resistance heater of about 1500-watt capacity. Usually, tube is fed from a rotating hopper at rate slugs can be fed into die. At the bottom of the tube, slugs are fed along a track and drop through a hole one at a time just before the punch makes its downward stroke.

Timing and heat added are such that slugs reach the die at the right time and temperature and are struck by the punch the moment that they seat in the die recess. Press work raises slug temperature a little. Preheating is adjusted accordingly.

Surfaces — Although extrusion requires less pressure as slug temperature is increased, high temperatures result in a less satisfactory surface. If the press has adequate capacity, it is better to run slugs at or near the lowest extrusion temperature feasible.

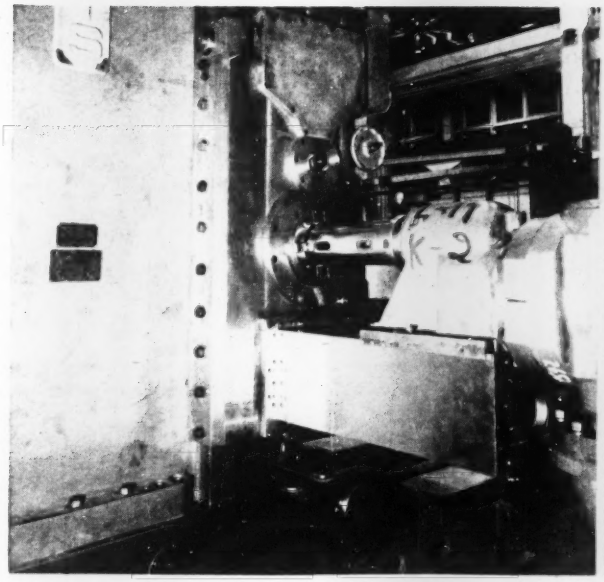
Slugs must contain enough metal, of course, to yield a wall of desired length and thickness and a bottom that generally is thicker than the walls. Usually, outer end of the wall is not perfectly square and must be trimmed to length, especially as the stripper may crush the end slightly if walls are thin.

For the above reason, most impact extrusions are made about 10 per cent too long and are cut in a trimming operation after air ejection from the die. If slug size is held precisely the same for each piece and the punch is stiff and remains precisely centered, extrusions can be produced with length held within ±1/32 inch without trimming.

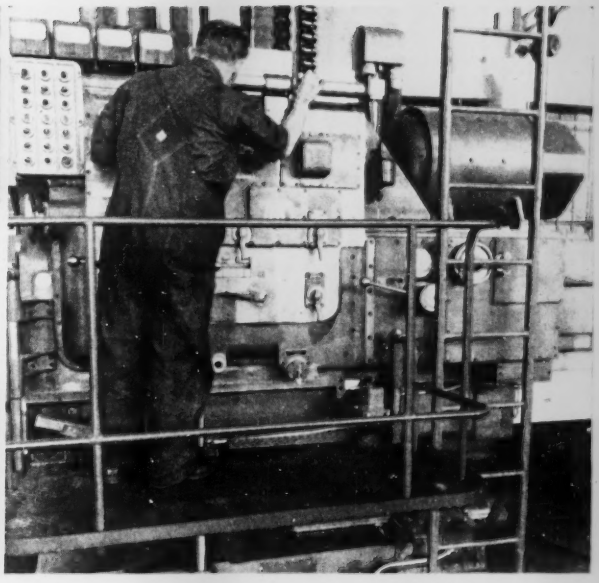
Cleaning — Graphitic lubricant remains on slugs and will cause corrosion problems if not removed. Extrusions should be cleaned soon after they are produced.

First step: They are given a 15-minute soak in the same caustic solution used for cleaning slugs. After rinsing in cold running water, extrusions are pickled in a solution, containing 40 per cent acetic acid, 5 per cent sodium nitrate and 55 per cent water. About 0.001 inch of metal is removed from all surfaces.

After another rinse in cold water, same bright pickle used in slug cleaning is applied in a 1-minute dip. Two rinses are next, first in cold and then in hot running water, followed by forced drying in air at 300 F. If removal of metal cannot be tolerated, other cleaning solutions may be employed.



Underarm support is encased in a housing under the headstock — adds 14 inches to the bearing surface



Vernier sight utilizes periscope principle to read scale and vernier on the column runway and on the ram

Boring Mill Has Strong Arm

New underarm support adds rigidity to operations performed away from the column on horizontal boring, drilling, milling machine. Bearing area on column is a help

MACHINE TOOLS, like aircraft, have a tie with the drawing board which is never quite severed. Every model, no matter how spectacular its performance, is constantly being revised, altered and improved.

Case in point is the floor-type horizontal boring, drilling, and milling machine to which Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., has added an improved underarm support.

Boardinghouse Reach — Underarm support permits working on surfaces at some distance from the machine headstock without resetting the work. Drive is taken from the machine spindle but load of the tools and of the cuts is carried by the underarm.

Bolted to the bottom of the headstock on the 570-FUAR boring mill, the arm is completely encased in a housing which lengthens bearing surface of the headstock on the column by 14 inches. Additional surface contributes to underarm rigidity and load distribution permitting heavier cutting operations at greater distances from the headstock face.

Convenient Controls — Addition of a foot-treadle clamp, used to secure the underarm in position affords greater operating convenience. Underarm is clamped by pressing down on the left side of the treadle. Depressing opposite side releases the underarm. Lever can be controlled from the floor by inserting an ordinary hand rod into the end of the unit.

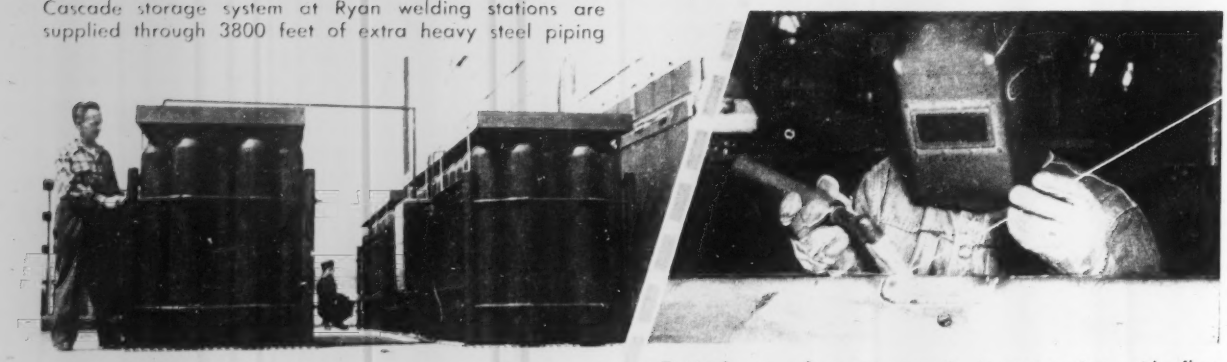
Hand lever, within easy reach of the operator permits hand or power feed to the 78 inches of continuous underarm travel or to the spindle travel at 1 to 1 or 6 to 1 ratios. Predetermined settings of travel can be made on dial which incorporates limit stops.

Other Changes — Additional modifications on the machine include a telescopic sight for reading scale and vernier settings on the machine runway or underarm, and a 2-ton crane, secured to the machine column, which eases the job of lifting and positioning the underarm attachments.

Attachments which can be used on the underarm machine include a face plate drive, 90-degree angular milling attachment, continuous-feed facing attachment and a clapper-box type shaping attachment.

Basic specifications of the machine are: 7-inch spindle, 141-inch vertical headstock travel, 96-inch horizontal travel of the column, 60-inch underarm travel and a 40-hp headstock motor.

Cascade storage system at Ryan welding stations are supplied through 3800 feet of extra heavy steel piping



Typical use of argon gas is in connection with fluxless, Heliarc welding of aluminum alloy structures

CUTS . . .

Three banks composed of 186 steel cylinders provide 52,000 cu ft of argon for 85 inert gas welding stations. Formerly, individual cylinders served each station

NEW argon gas storage and distribution system at Ryan Aeronautical Co., San Diego, Calif., is expected to save thousands of dollars each month by reducing gas costs, eliminating lost welding time and avoiding all gas bottle handling.

Unique system is a 52,000-cu-ft storage facility composed of 186 steel cylinders which are manifolded together in three banks. From these, network of 3800 feet of extra heavy steel piping feeds argon gas to every inert, gas-shielded, arc welding booth in all factory buildings. Storage system was installed by Linde Air Products Co., New York.

Before—The 85 inert gas welding stations at Ryan had been served with individual argon gas cylinders. This presented a number of disadvantages when compared with the new central storage system. For example, each welding booth was subject to gas depletion every time gas pressure in a cylinder dropped to 25 psi.

This required a replacement service in which a full cylinder was brought to the station and installed. On each occasion, depleted bottle had to be disconnected, gage removed and attached to the full bottle, line blown to remove dust and the new bottle attached.

During this procedure, welding was interrupted and valuable production time lost. It is estimated that each cylinder replacement cost between $1.25 and $1.50 for labor alone, without taking lost production or gas costs into account.

Waste—Another item of cost incurred was the value of residual argon left in each cylinder. Bottles were replaced while they still contained 25 psi of gas.

To provide a ready supply of argon cylinders, used at the rate of 572 a month, groups of them were stored within the plant. Safety hazard resulted because cylinders were charged to a gas pressure of 2200 psi.

Savings—Major financial benefits will accrue from bulk purchases. Instead of using gas in 275-cu-ft bottles, system can be charged with thousands of cubic feet in a single operation.

It's a simple matter to check exact volume of gas in system by reading pressure and temperature gages and consulting a chart. When a bank drops to a predetermined volume, supplier is called. While one bank is being replenished, another is used to feed the plant. Third is employed as a standby. In this way, all previous production interruptions caused by local gas shortages and shutdowns are avoided.

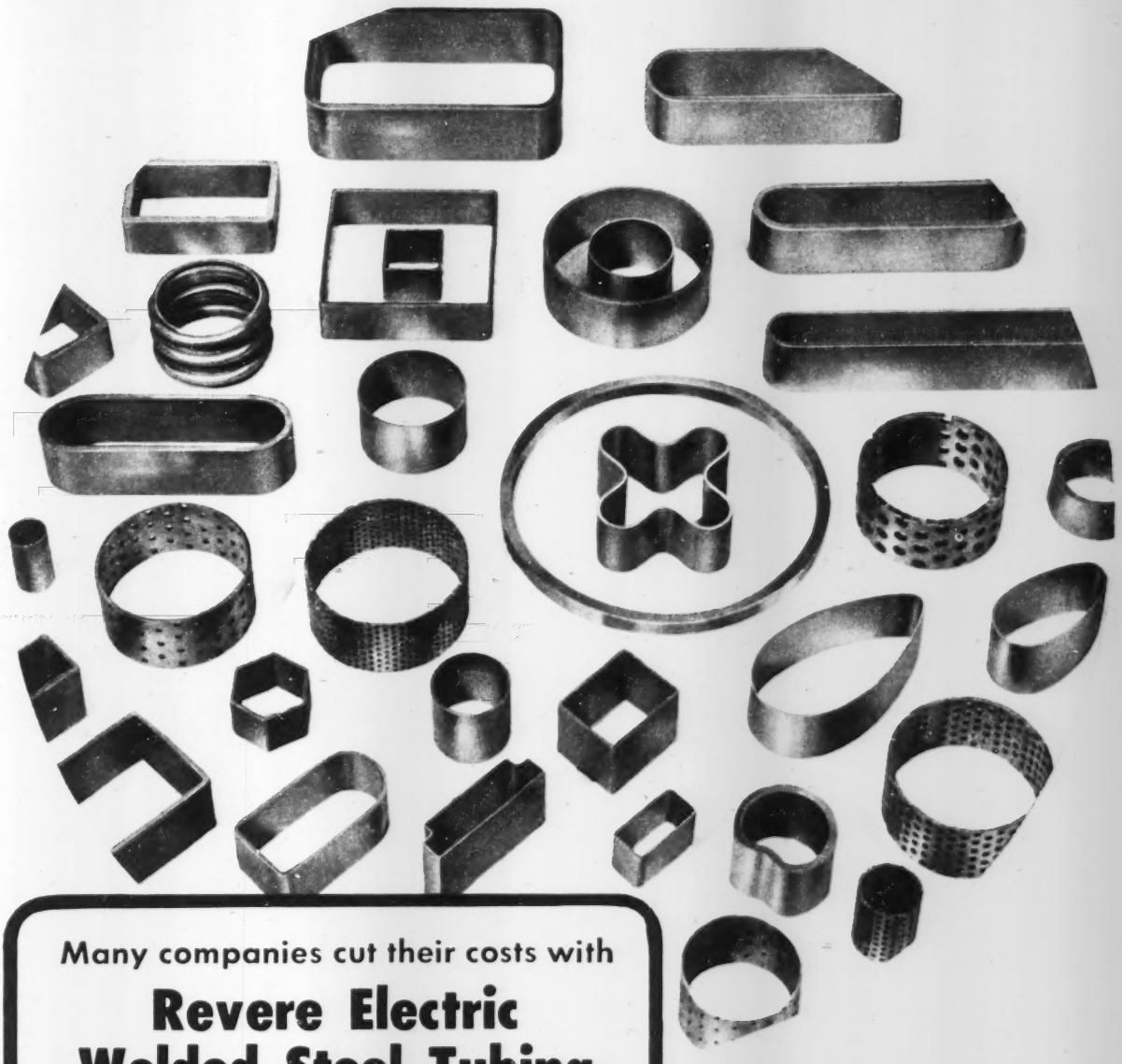
Operation—Pressure of argon is regulated to 25 psi as it leaves the storage system and further regulation is not required at the 85 welding stations.

Welding booths are equipped with Ryan-designed gas and water flow timers. These devices automatically control the flows of argon and cooling water during the welding process. Their action is designed to provide a time gas flow after welding ceases to protect the hot electrode from oxidation.

Because they save substantial amounts of gas, by eliminating guesswork, timers pay for themselves in 60 days. Engineers estimate new storage facility and automatic timers will save more than $5000 a month in argon gas costs.

Argon — This gas is used for most of the shielded arc welding at Ryan, because it is best suited, physically and economically, for these tasks. Obtained through the fractional distillation of liquified air, commercial argon is 99.9 per cent pure. Figure is far above the purity standards of commercial helium, also used for shielding purposes.

Argon is heavier than helium and only two thirds as much is required to duplicate a weld made with the latter. But in some cases, Ryan uses helium gas for automatic welding of aluminum. It lends itself to higher welding temperatures and faster speeds.



Many companies cut their costs with

Revere Electric Welded Steel Tubing

Available from ¼" to 4½" O.D. — Walls from .025" to .187"

A leading maker of appliances was using a heavy tubular member as a wringer post extension. With the collaboration of Revere Steel Tube engineers, the manufacturer developed a simple fabricated part of Revere Electric Welded Steel Tube, supplied ready for assembly. This reduced the thickness of the tube wall by half, cutting costs considerably and making the machine somewhat lighter and thus more attractive to users.

Revere offers you Electric Welded Steel Tube in the shapes shown here, and many others. The tube can be made so it is impossible to find the weld. Our Technical Advisory Service will gladly collaborate with you on applications to your product.

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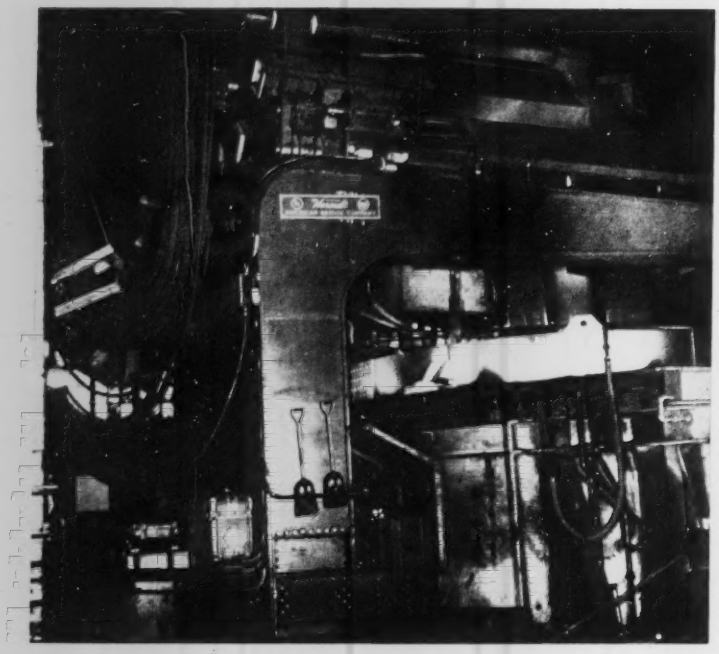
SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS



Carbon Steel Ingots

THIRTY PER CENT ELECTRIC BY 1975

Higher power and larger electrodes will be employed on large electric furnaces in the future. AISE papers highlight other industry trends, progress and improvements

OUTPUT of electric furnace carbon steel ingots in 1975 will be 30 per cent of the total carbon steel ingots produced. This prediction was made by Willard C. Wheeler, management consultant, New York, at the 1953 convention of the Association of Iron and Steel Engineers, William Penn Hotel, Pittsburgh, Sept. 28-Oct. 1.

Mr. Wheeler contended that the rate of increase in carbon steel ingots over the past 34 years, if projected to 1975, will mean about 162 million tons or 84 per cent greater than current steel production. In his opinion, 43 million tons of the 1975 output will be electric steel carbon ingots, thus pointing to new and additional electric furnace units.

At the electric furnace session, opinion expressed by various steelmakers was that large electrics in the future will be higher powered and will employ larger and more dense electrodes. Many electric furnaces now are door charged and greatly underpowered, but by making changes in shop layout and equipment their output can be increased.

The annual spring conference of the association will be held at the Bellevue-Stratford hotel, Philadelphia, May 3-5, 1954. A feature of the meeting will be an inspection trip through the Fairless Works, United States Steel Corp., Fairless Hills, Pa. The next annual convention and biennial exposition will be held in Public Auditorium, Cleveland, Sept. 28-Oct. 1, 1954.

Important phases of steel plant operation were brought out in the following papers:

Improved Cleaning Techniques for Open-Hearth Checkers, by J. J. Enochs and R. Kinkaid, sales engineers, Dowell Inc., Wilmington, Del., and Chicago Heights, Ill., respectively. A newly developed process for chemically cleaning open-hearth checkers during the operation of the furnace, has resulted in improved operating efficiency, reduced fuel and maintenance costs, and increased production.

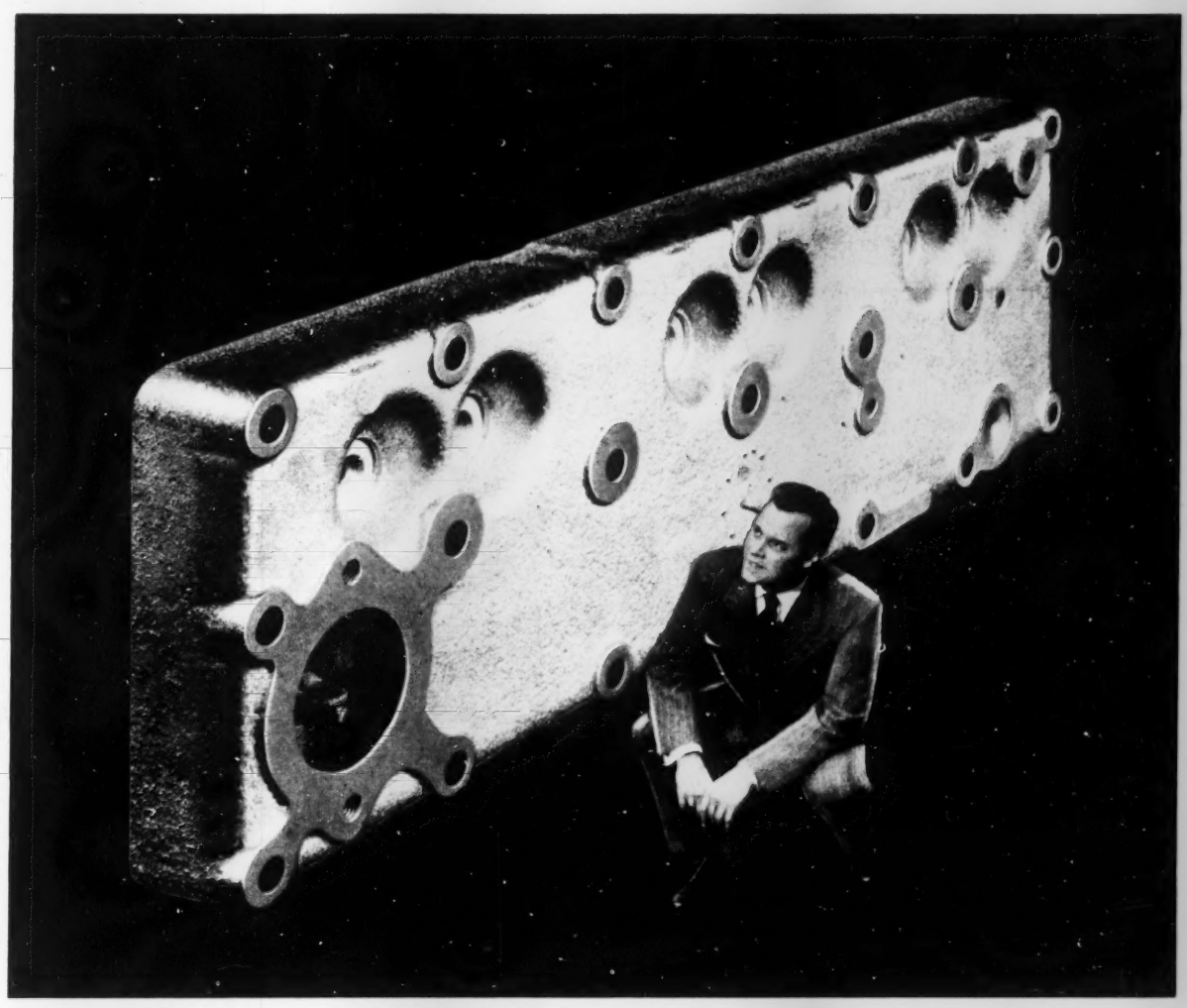
Process consists of pumping chemical solvent solutions at 2500 psi through jet nozzles. The latter are inserted in a section of monel bar stock, attached to a short length of heavy-duty $\frac{3}{4}$-inch pipe fitted with high-pressure cap. A pair of $\frac{3}{8}$-inch steel rods serves as runners to support the assembly.

Pumps Solvent—The nozzle assembly is fastened to the end of a steel lance of sufficient length to extend the full width of the checker chamber. Solvent is fed by a reciprocating pump through a flexible high-pressure hose to the lance and thence to the jet nozzles.

The pump with 1000-gallon tank to transport the chemical solvent, is truck mounted so that the equipment can be moved from one location to another. A specially designed jet nozzle assembly is used for cleaning off the top of the checkers at the end of a treatment.

No Downtime, If—In small furnaces the cleaning operation can be completed in $2\frac{1}{2}$ hours. Large furnaces of 400 tons require from 8 to 11 hours. In one open-hearth furnace, the total man-hours re-

Continued on p. 124



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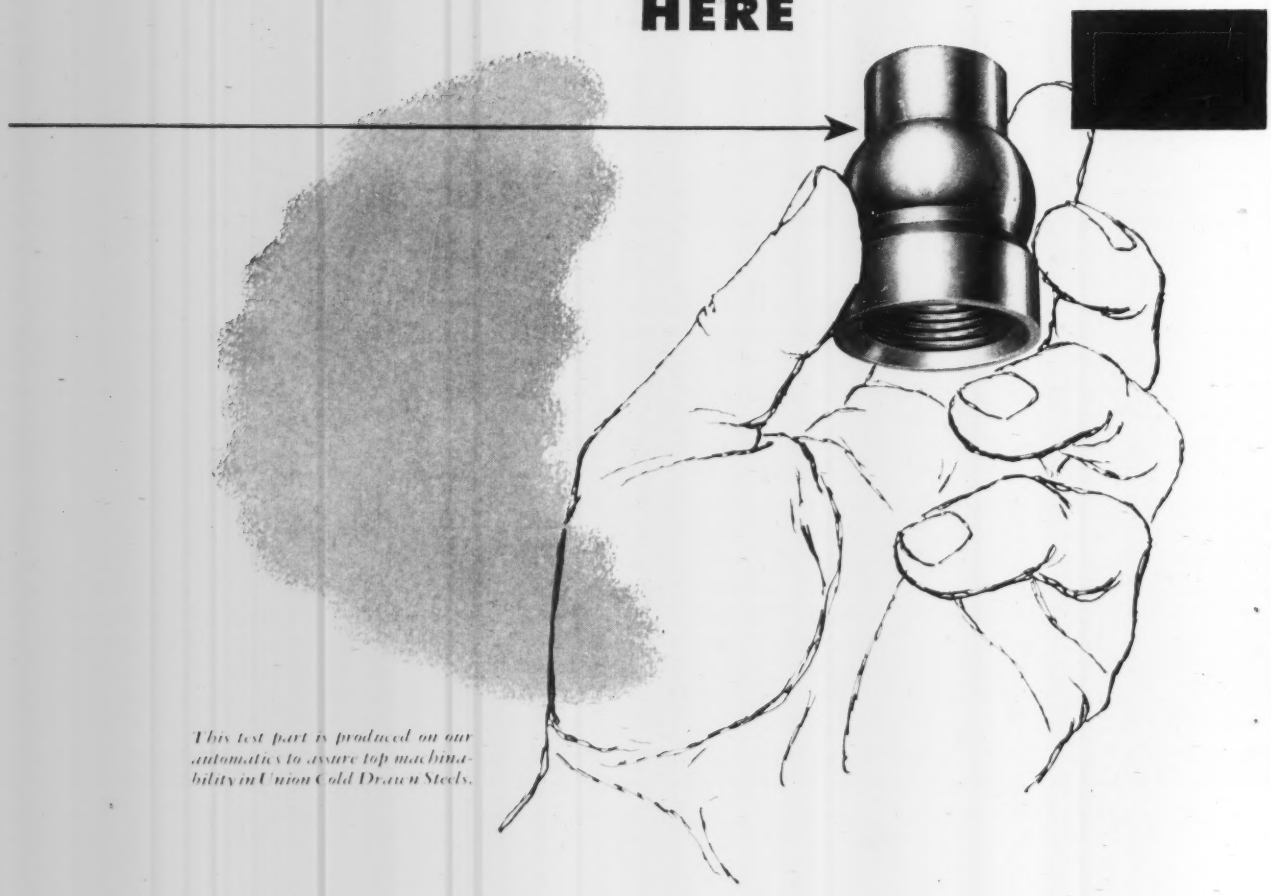

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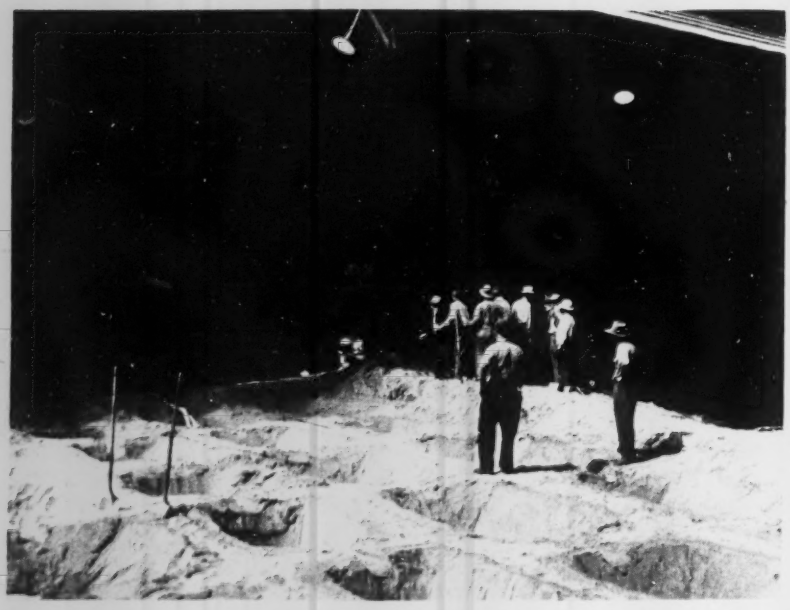


Bottom Tapping At Ford's Rouge Furnace

For the first time in its history, Ford Motor Co. drained its Henry Ford II blast furnace preparatory to relining the 800-ton-per-day producer. Pits were dug in sand outside the furnace and some 400 tons of iron-slag mixture were emptied. Furnace campaign was eight years during which time 1,984,764 tons of iron were cast. Furnace will be back in production in about 45 days

Continued from p. 120

quired for cleaning the checkers was reduced from 685 (mechanical) to 32 (chemical). Chemical cleaning may require no downtime providing the accumulation of deposits in the tunnels is not too great.

About 400 F drop in the checker temperature usually is experienced during chemical cleaning. Following the treatment, the checkers return to normal operating temperatures.

One steel plant reports a savings of 48-hour downtime and $15,000 worth of refractories. Improved operating efficiency raised the tonnage output from 22 to 24 tons per hour.

Cleaning Open-Hearth Checkers and Sewers During Operation, by R. M. Jordon, Assistant Superintendent No. 3 Open-Hearth Shop, Bethlehem Steel Co., Lackawanna, N. Y. Attention recently given to checkers and their maintenance may be ascribed to the increased amount of dirt resulting from the extended use of pitch as fuel on a large number of furnaces and from the additional dirt created by higher firing rates.

At the Lackawanna plant the hot-pass checkers on pitch-fired furnaces are blown twice a week, the cold passes once a week. Single-pass checkers on pitch-fired furnaces must be cleaned twice a week, while single or double-pass checkers on oil-fired furnaces require blowing every seven days. In using 30 per cent pitch on a furnace, or firing with 100 per cent pitch, the amount of flue dirt deposited in the checks seems to be the same.

Minor Explosion—To clean the checkers, 1-inch diameter pipes of various lengths with an 18-inch gooseneck, are used. Through these pipes a combination of water and compressed air is used on hot and single passes where the fuel is pitch. The blower opens the water side of the 3-way valve and lets in enough water to fill the pipe, and then opens the valve on the air side. Air at 80 psi drives the slug of water down into the flue, and if the flue is plugged, the water hits the hot flue dirt, is converted into steam, and with a minor explosion drives the dirt out of the flue. To obtain the best results the checkers should be hot and care should be taken not to cool them by using too much water. Compressed air is used on all cold passes and on single and double-pass checkers when oil is the fuel.

Trends in Blast Furnace Linings, by H. M. Kraner, Ceramic Engineer, Bethlehem Steel Co., Bethlehem, Pa.—Laboratory tests show that the increase in density and impermeability produced by hard firing improves the resistance of the refractory to slag and alkali attack.

Carbon in the proper location offers hope of extending the life of the furnace, particularly in hearth walls. The use of clay brick in the hearth wall may be practiced if the carbon is placed against the cooler with the clay brick on the hot side. By this arrangement the carbon cools the clay brick wall and extends the life of the clay brick.

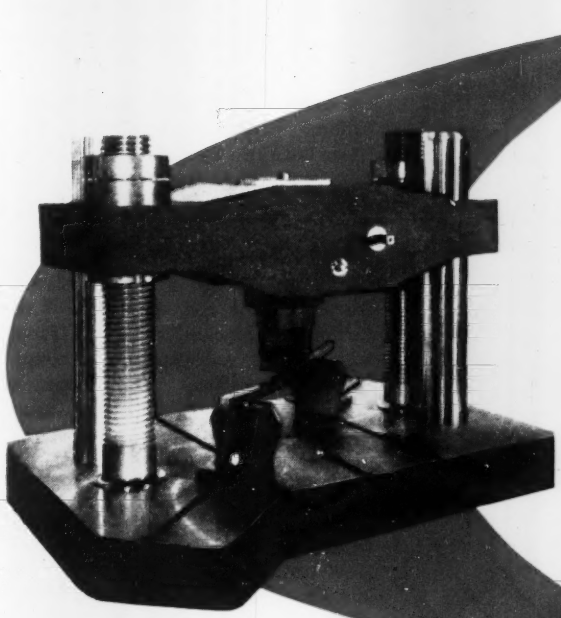
Long Campaigns—High bulk density super-duty brick with low potential heat shrinkage have performed a good job in the hearth bottom. Where such furnaces have been blown out, two and one-half courses of 18-inch blocks of this material had disappeared in campaigns of almost 2 million tons.

The combination of carbon sidewalls with high bulk density brick of adequate refractoriness in the bottom appears to be a happy combination for a prolonged life and generally satisfactory hearth design.

Recent temperature measurements in clay brick walls have revealed blow-in heating rates of 1000 F or more in a few minutes, which is destructive to clay refractories. Use of 9-inch second-quality brick serves as a protective lining against oxidation of hearth walls. It will also protect the tuyere breast and bosh brick against excessive heating rates.

The English found that carbon brick would not stand oxidation above the mantle. (Discussion, however, brought out the fact that the English used insulation between the shell and carbon brick which led to the failure.)

Application for Laminated Fabric Bearings, by R. L. Berry, Manager, A-B-K Sales, American Brake Shoe Co., Detroit.—A suggested lubrication practice for thrust collars, especially when the section being rolled necessitates high-lateral pressure, is to make wedge cuts in the face of the collar. The



Typical set-up for testing bending stress in bar stock.

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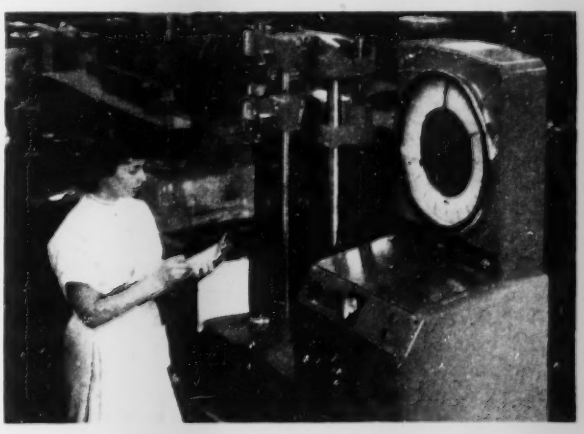

Riehle Universal Testing Machine checking tensile strength of a finished part.

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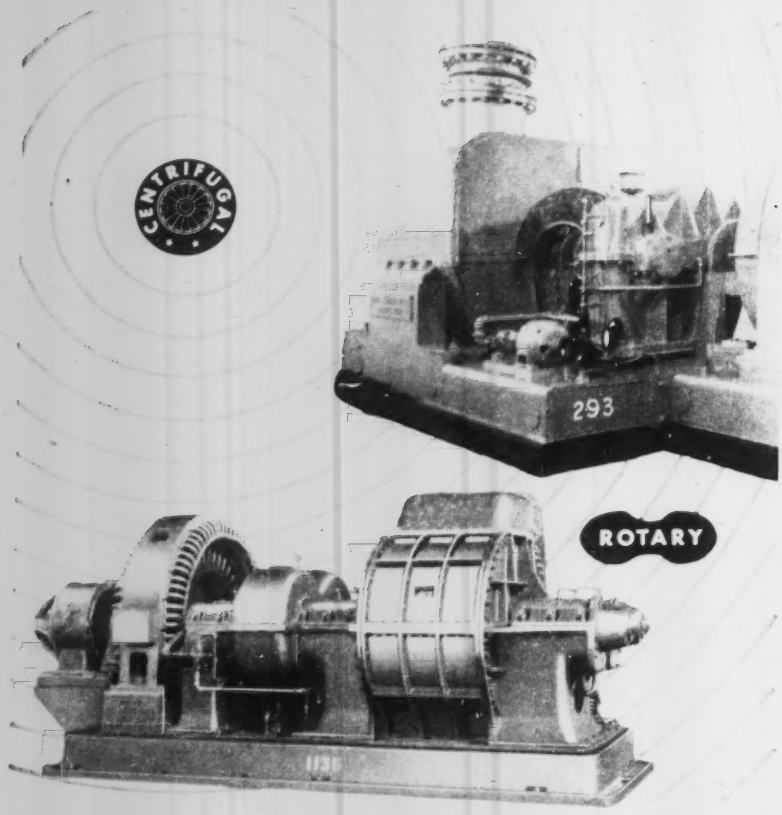

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cut is about $\frac{3}{8}$-inch wide, $\frac{3}{8}$-inch deep at the top tapering and narrowing to zero at the bottom. Sizes of the cuts and the number used are dependent upon the size of the collar. Under extreme pressure these cuts can be filled with grease. This procedure also reduces the initial torque after "down" periods.

When grease is introduced in a composition bearing, a heavily chamfered hole has proved effective as its method of entry. This forms a lubricant reservoir from which the grease spreads through the bearing area. On reversing mills two such entry ports are suggested, both located out of the major load area.

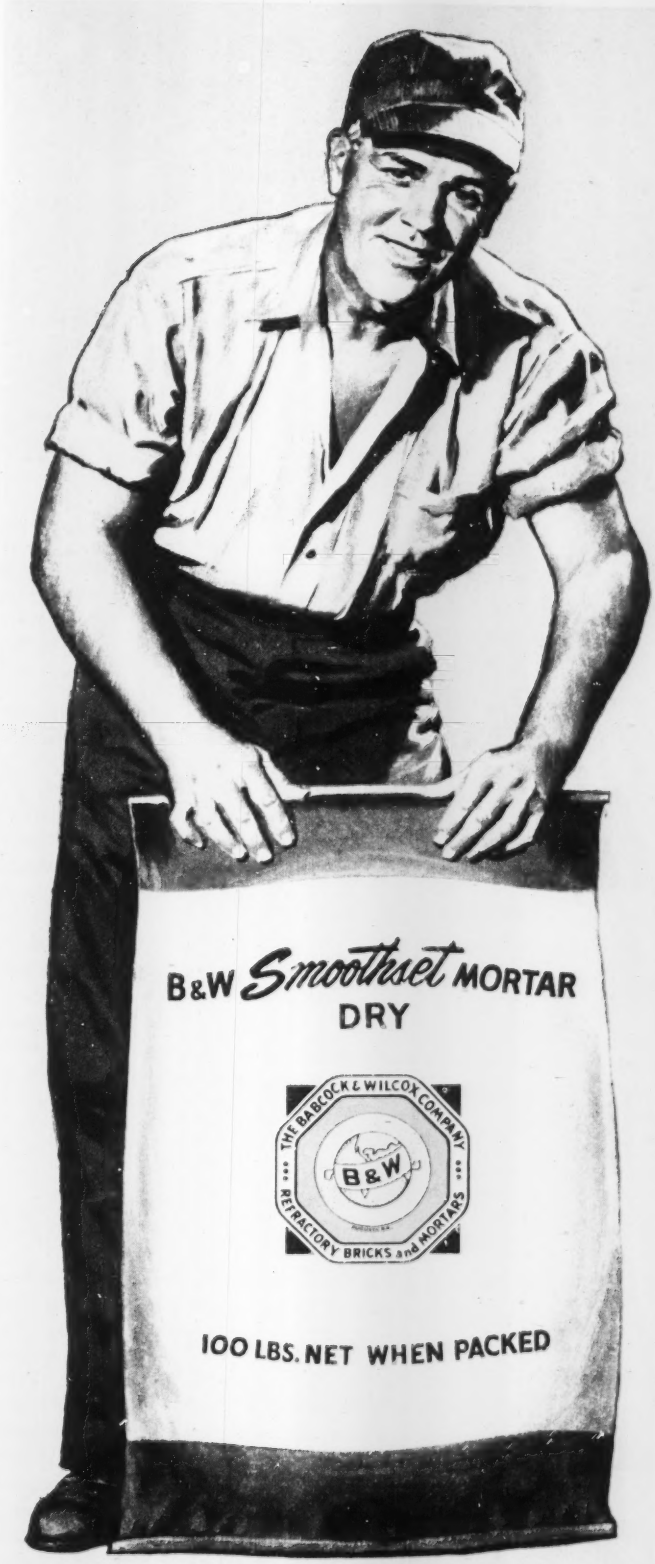
Choice of Grease—Either soluble or nonsoluble greases are acceptable for these high-pressure slow-speed applications of such specification that the film will resist rupture even under maximum loads. Quantity of grease for such applications depends on the specification and the nature of the operation. A good working rule is $\frac{1}{3}$ or less than that necessary for a metallic bearing in the same application.

Recent contained neck designs provide for thrust of the roll in either direction in only one chuck. This is accomplished by various methods of rings and thrust discs on the roll and opposite the drive. By anchoring the thrust in only one chuck, problems due to roll expansion, have been minimized.

Progress in the Development and Application of Metallic Recuperators in the American Steel Industry, by E. A. Vierow, Superintendent, Fuel and Power Department, Youngstown Sheet & Tube Co., Youngstown, O.—Modern metallic recuperators provide an adequate supply of unadulterated preheated air, make possible good metering of air to gas, and deliver air to the burners at the desired pressure.

The possibility for increased production has been the motivating force in recent installations on hot strip mill slab heating furnaces. Performance of these furnaces is even exceeding the expectations regarding output.

Advantages—Today only about 125 steel heating furnaces are equipped with metallic recuperators in American plants. It is



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Here's the mortar refractories masons asked for—and it's as easy to use with insulating firebrick as the popular wet B&W Smoothset because it has the same high water retention.

This property is important because the highly porous structure of insulating firebrick draws the moisture rapidly from the mortar, thus allowing too short a time for proper placing and setting of the brick before most mortars become unworkable.

Besides high water retention, the new dry B&W Smoothset can be stored indefinitely in a dry place without hardening—a big advantage on large jobs when refractories are installed over a long period of time.

In addition to helping you select the most economical refractories, your local B&W Refractories Engineer will be glad to help you select the best mortar for your installation. Next time you build or reline your furnace, get the benefit of his long experience.

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Press Ram Revival

Hydraulic press ram is metallized by New England Hard Facing Co. after severe galling in lower half made it almost useless. Two Mogul guns sprayed 260 pounds of stainless wire, with no pressure loss due to leakage

thought the hesitancy will disappear as it becomes apparent that properly applied preheated air is an excellent vehicle for increasing the heating capacity of the furnace and improving the quality of heating and for attractive fuel savings.

Air heaters are reportedly credited with raising the effective steam generating capacity of boilers as much as 20 per cent with fuel savings up to 9 per cent. In comparison, recent installations of metallic recuperators have shown effective heating capacity to be increased as much as 20 per cent, with fuel savings up to 30 per cent. Use of metallic recuperators in heating furnace operations offers an excellent opportunity for the steel industry to make substantial savings in production costs.

Recent Advancement in Continuous Buttweld and Induction Pipe Mills, by William Rodder, Vice President, Engineering, Aetna-Standard Engineering Co., Pittsburgh.—Advancements made during the past five years in the design and construction of new continuous buttweld pipe mills have contributed materially to the increase of production of smaller pipe sizes. Increase in output has been obtained without increasing the manpower of the hot mill. The quality of the weld has been improved by the in-

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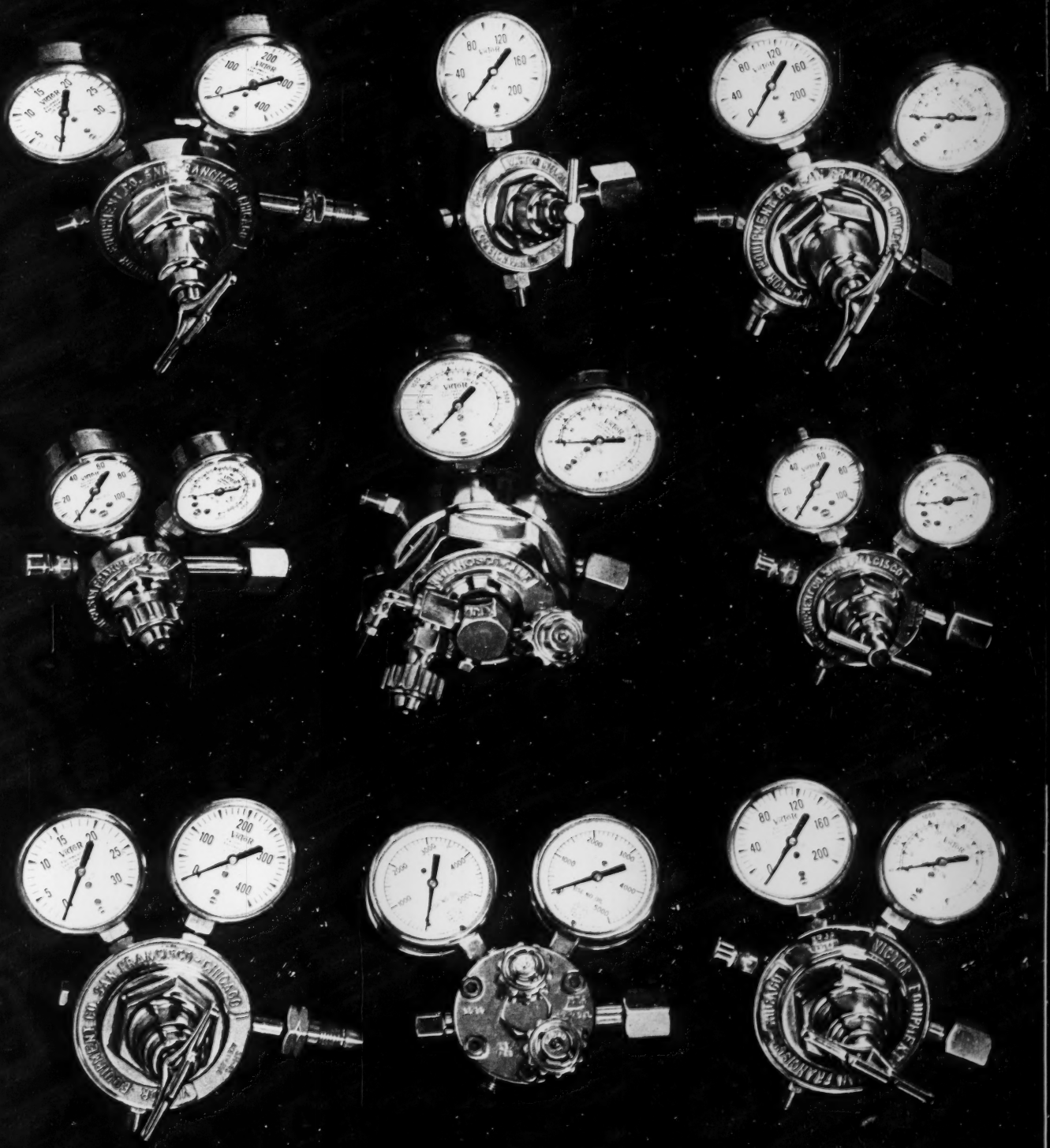

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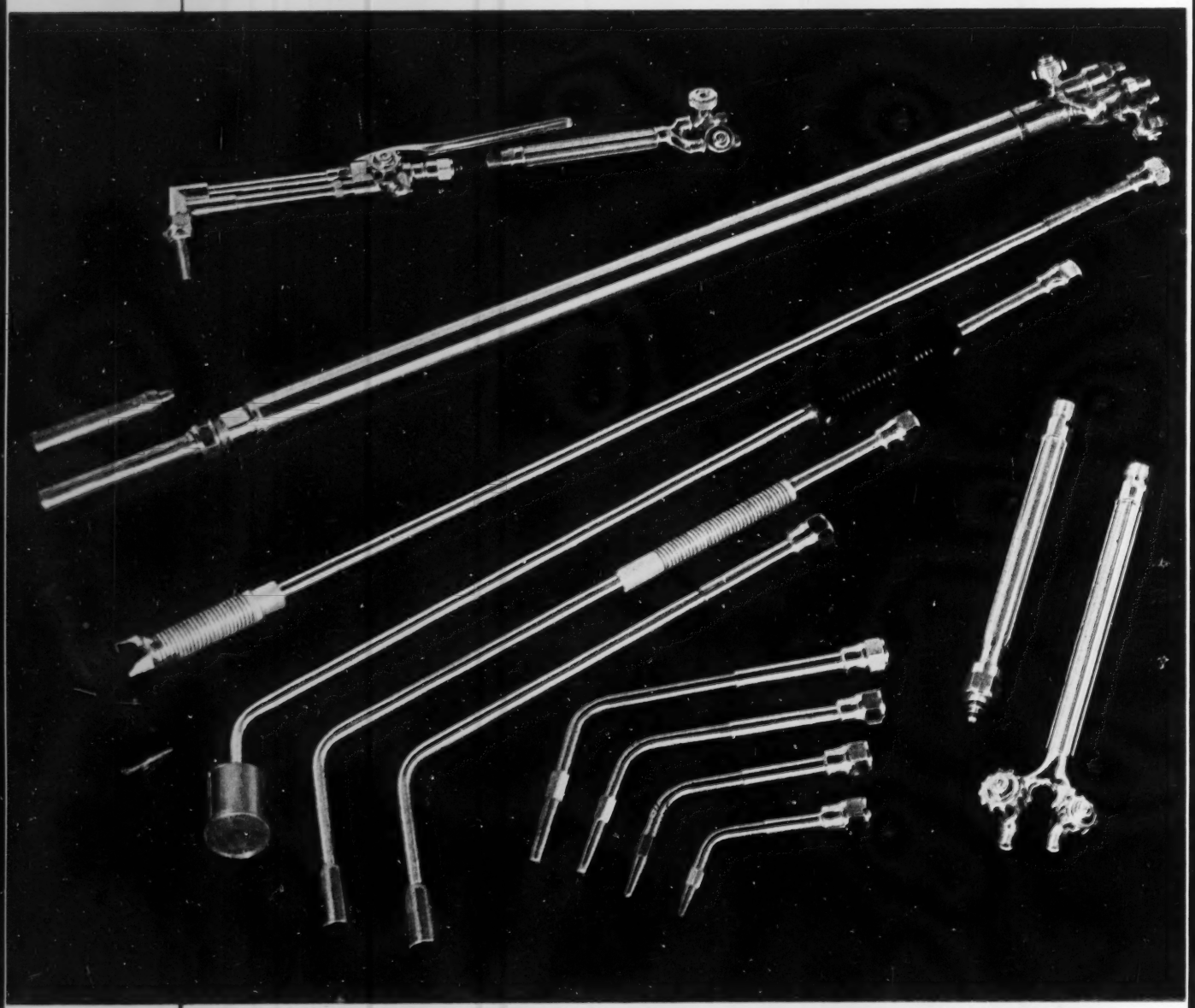

TOP TO BOTTOM: *VICTOR 100 series welding torch butt and C 1450-100 cutting attachment. 4000 series machine cutting torch. Stainless steel model 362 descaling attachment and preheating nozzles stay cool longer. Type 3 welding nozzles and 320 torch extension for 300 series welding torch butts (lower right). No wrench needed to change attachments.*

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creased reduction of pipe after the weld has been made.

The principal bottleneck, which prevented an increase in speed and production in the past, was the flying saw. But increased sawing speed has been made possible by adopting a saw design where the saw blade travels continuously in a circular path. This design completely eliminates all accelerating and decelerating forces and wear and tear of equipment. Actual top speed of 1100 fpm has been obtained, this being limited by the heating capacity of the furnace and not by the saw.

Shift Ranges — Length of cut within each cutting range can be varied from the operator's pulpit while the mill is at full speed. Gear shifts are provided to change the saw from one cutting range to another. The linear speed of the saw blade during the cutting interval is synchronized with the pipe speed. The travel of the crank which carries the saw is maintained equal to the length of pipe to be cut.

When a cutting length variation is to be made, the crank rpm is changed simultaneously with the crank radius so that the linear speed of the saw is maintained. Whenever a cut is made, the pipe, by means of a rotating lower cutting cam, mounted on an eccentric, is deflected into the path of the saw blade travel.

Water Supply for Steel Plants, by Ross Nebolsine, President, Hydrotechnic Corp., New York. — On the basis of 80 to 85 million tons of finished steel, the daily pumpage of water by American steel plants is about 9 million gallons a day, or almost 10 per cent of total industrial water requirements. It is estimated that less than 1000 gallons per ton of finished steel, or about 2 per cent of the circulated supply, is not returned by steel plants through its sewers to the drainage basin.

The capital cost of water supply installations, including subsidiary pipe networks, constitutes only about 3 per cent of the total cost of an integrated steel mill. Total operating charges including interest on the investment at 2 cents per 1000 gallons would average 80 cents a ton, or about 1 per cent of the cost of making finished steel.

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Fabricators rely on G. O. Carlson, Inc. for stainless steel heads produced to exact specifications and for other components of stainless steel tanks. Shells, flanges, rings, pads as well as spun or press-formed heads are readily available as a packaged service. This eliminates the need of multiple ordering from several suppliers and places responsibility in the skilled hands of Carlson specialists.

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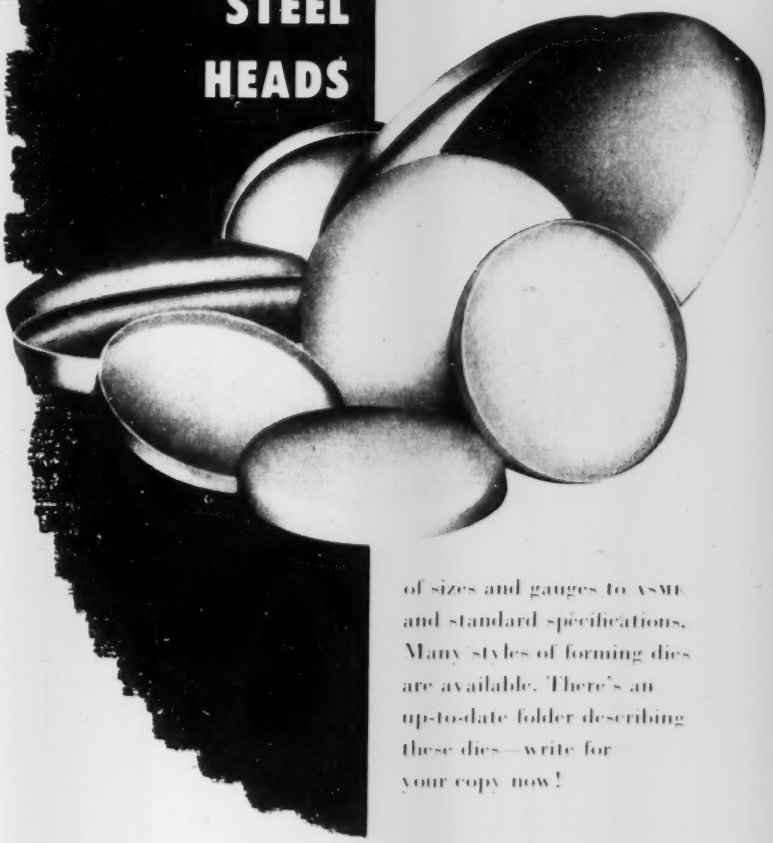

of sizes and gauges to ASME and standard specifications. Many styles of forming dies are available. There's an up-to-date folder describing these dies—write for your copy now!

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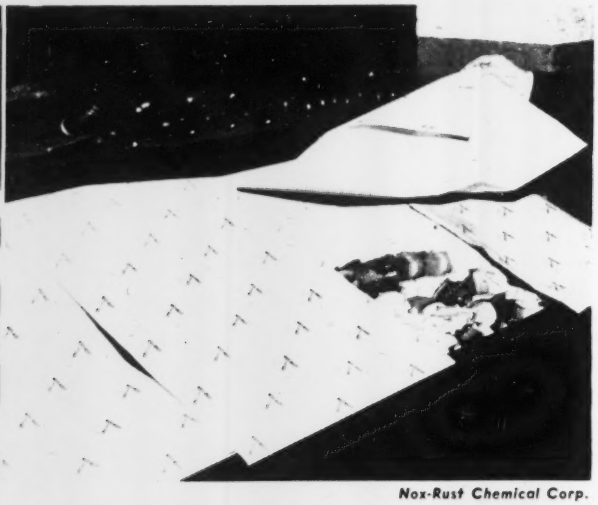

Nox-Rust Chemical Corp.

To protect parts that must be stored between processes or are sidetracked to await final assembly, box is lined with inhibiting paper, then has additional VPI draped on top

Packaged Corrosion Losing to VPI

Vapor phase inhibitor continues to get high marks in preserving ferrous parts. It's making many of the messy, expensive and inconsistent methods obsolete

By WILLIAM R. WOLFE
Assistant Editor

ABOUT THREE years ago, Producto Machine Co., was shipping die sets (packed in moisture-containing boxes) coated with petrolatum to protect against corrosion. The petrolatum was carefully applied, laboriously removed by customers, but cases of rust on dies were common.

With the strong sales point of customer convenience, plus an important time factor at stake, the Bridgeport, Conn., firm turned experimentally to a compound just emerging from its development stage. They packed uncoated die sets in a box, threw in a handful of little white crystals and nailed down the lid. Result: No rust.

As of early summer, Producto's production manager says the company had shipped about 70,000 die sets protected by these VPI crystals without a single set being rusted on arrival. Consumption of crystals has averaged 12 pounds per month at a cost of about $60.

Genesis—Producto's experience was typical of many who arrived at the same experiment at about the same time. Those who didn't or haven't and have a problem of protecting ferrous parts in shipment or process, can no longer afford to ignore its profit potential.

Progress of the vapor phase inhibitor is a reflection of the ingenuity of Shell Development Co. research men who first announced the product in 1946. One indication of the demand for a simple-to-apply inhibitor: Sales in 1952 exceeded those for five years.

Proper name for the chemical is dicyclohexylammonium nitrite. Because its action is vapor phase inhibiting, Shell adopted the trade name VPi. For lab purposes, chemists contracted the tongue twister to dichan. The military says the chemical is volatile corrosion inhibiting and calls it VCI.

What Does It Do?—By any name, its action is the same: Nitrite ion renders moisture noncorrosive. At first, Shell discovered that nitrite ion trace in water containing oxygen prevents corrosion of submerged parts. While this made an interesting lab report, it had little practical value as long as parts had to be submerged to prevent corrosion. Shell then came up with its amine nitrite compound that protects through the vapor phase by contributing nitrite ion to condensed or absorbed moisture on a metal surface. Volatile characteristic is merely a means to transport the inhibitor.

What Is Required—For a volatile inhibitor to have ready commercial application, it must meet three general requirements: Easy and economic use; effect in a wide range of atmospheric conditions; reasonable durability; and freedom from objectionable properties. Extensive testing and wide usage establish the conclusion that VPI in its present stage of refinement meets all three, the first at times sensationally, others with limitations.

An example of how its use sim-

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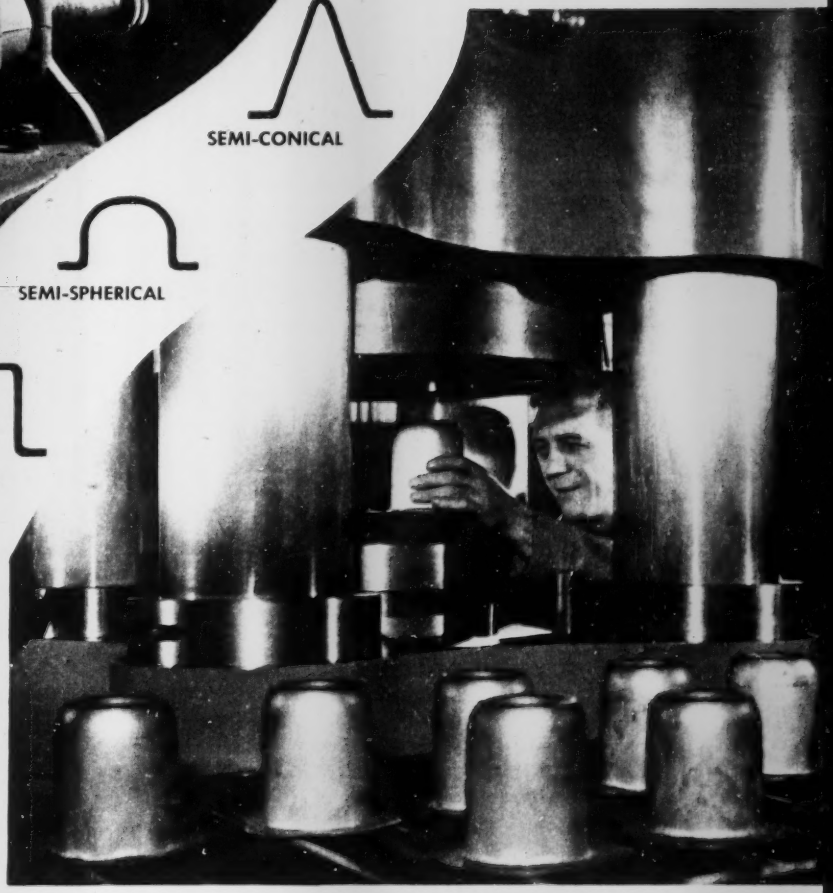

THESE TWO BASIC FORMING METHODS PROVIDE COMPLEMENTARY FACILITIES FOR THE FULL RANGE OF THESE THREE FUNDAMENTAL SECTIONS — SPINFORMING IS MOST EFFECTIVE FROM SEMI-CONICAL TO SEMI-SPHERICAL AND CYLINDRICAL, — HYDROFORMING IS MOST EFFECTIVE FROM CYLINDRICAL TO SEMI-SPHERICAL AND SEMI-CONICAL.

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New techniques and engineering procedures are greatly enlarging the scope of industrial uses for spinforming and hydroforming, while the complementary nature of these facilities often permits tooling for one method to be used for quantity production by the other.

Fabricated items range from giant spinnings to thimbles; from deep drawn cylindrical pieces to one piece spout drawn pitchers and multi-shape formings, including parts from an increasingly wide range of gages, diameters and materials, as the expanding facilities at Roland Teiner continue to enlarge to better serve industry.

If you are redesigning for appearance, cost or function, or are developing new parts or products, find out about these new facilities early. Send drawings or specifications for quotations, or write for literature by title; "Spinning Principles of Economical Design", or "The Hydroform Operations Savings Table".

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Angier Corp.

Machine tools are stored for extended periods with paper wrap supplemented by crystals in machine cavities. Barrier wrap sheds water, confines vapors

VPI wrap is applied here to export packaging of tire bead wire at Johnson Steel & Wire Co., Worcester, Mass.

plifies operations is seen in one of its first military applications. One ordnance expert estimates it takes about 27 manhours, using skilled personnel, to complete the unpleasant routine of unpacking, disassembling, cleaning and reassembling a single case of 10 M-1 rifles. The same VPI-protected pieces are unpacked and prepared for use fired if necessary by a single man in 30 minutes. And at the packing end no-one has to tear down each rifle and apply grease or oil.

Application convenience is enhanced by the variety of techniques available to users. In addition to the crystals themselves, two others exist.

The most common and easiest to apply to the average-size component or product line is a wrap of kraft paper or cardboard coated with the dichan chemical. This method is also predominant where parts are protected between processes or in inventory. Solubility data show the chemical is moderately soluble in water, very soluble in methyl alcohol, so a dip method proves equally satisfactory but requires additional equipment. Crystals are applied by hand, squeezed from plastic bottles, sprayed from garden dusters and soon will be available in powders granulated fine enough to use with an air gun.

Economics — Reduced to cold economics (actually the most stringent considerations) VPI measures up. One of the most prolific users of coated paper is General Motors Electro Motive Division at La-Grange, Ill. On one diesel engine part alone the division cut unit packaging cost from $5.40 to 35 cents. In packaging piston heads and liners, they total an annual saving of $300,000. Preservation of parts is accomplished on a near-100 per cent basis. Several steps, including a 24-hour parts layover for drying out, have been eliminated completely and mean clear aisles and greater warehousing and materials handling efficiency.

Another firm, Fairchild Instrument & Camera Co., Long Island, N. Y., finds a simple envelope coated with VPI the solution to its problem of protecting intricate subassemblies between completion and final assembly. An example: Shutter mechanism for model T-11 cameras, a complex mechanism that cannot be greased and has many carbon steel components, such as 0.001-inch shutter leaves.

Limitations—Despite advantages that accrue to users by way of its economic virtues, universal acceptance of VPI protection has hinged to a considerable extent on definition of physical limitations. An industry shipping and storing products all over the world must have protection capable of meeting atmospheric extremes. It is primarily concern over this factor that has kept military acceptance on a limited-application basis.

What are these limitations? In a six-month test at 150° F, polished steel strips came through perfectly when protected by 0.5 gram of VPI crystals. Strips were placed in quart bottles with crystals and a glass beaker containing about 5 ml water.

National Association of Corrosion Engineers made tests with small packages in a lab climatizer to determine reaction on bar steel wrapped in coated paper to wide temperature cycle at high humidity. Humidified air—95 to 100 per cent—was passed separately over each package at 20 fpm once through. Temperature was cycled 4 hours at 60° F, 16 hours at 93° F, with 4 hours heating and cooling between. Specimens wrapped in VPI-coated paper in cardboard boxes overwrapped with kraft-asphalt-kraft paper were protected completely after 28 days.

PROTECTION LIFE OF PACKAGES

PACKAGE COMPOSITION Dichan Carrier	Outer Barrier	MONTHS PROTECTION Shelf Storage Indoors (Wind < 1 Mile/Hr.)	Open Shed Storage Outdoors (Wind 3-10 Miles/Hr.)
Kraft paper	None	10-14	
Waxed kraft	None	24-48	12-18
Kraft-asphalt-kraft	None	24-60	12-30
Cardboard	None	12-18	8-12
Waxed cardboard	None	24-60	15-24
30-lb. kraft	Kraft paper	15-24	3-15
30-lb. kraft	Cardboard	15-30	9-21
30-lb. kraft	Waxed kraft	75 to >120	24-54
30-lb. kraft	Kraft-asphalt-kraft	75 to >120	36-60
30-lb. kraft	Waxed cardboard	75 to >120	24-54
30-lb. kraft	Films: Moisture-proof cellophane, Pliofilm, Saran, Koroseal, Ethocel or polyethylene	60 to >120	
30-lb. kraft	Metal foils or laminates	90 to >120	90 to >120

National Association of Corrosion Engineers

Protection life of packages wrapped in various types of VPI-coated paper and using several barrier materials

Angler Corp.

Pump part is prepared for shipment at Byron-Jackson Co., Los Angeles. VPI packaging method saves slushing

Tests under even more extreme temperature cycles—150 to —10° F—for brief periods also resulted in complete protection when a minimum 0.46 gram per sq ft of dichan was used in vapor wrap.

Practical Approach—While such laboratory work can establish a few general reactions, each storage and shipping problem must be viewed with an eye to the job that must be done to determine applicability of VPI. This practical approach was followed by GM's Electro Motive people when they instituted the packaged program cited above.

The division wrapped 36 exhaust valves in VPI paper, placed them in an ordinary reverse tuck carton, which they stored outside at La-Grange during the month of February.

Then they shipped the carton to Coral Gables, Fla., where it was exposed directly to salt water atmosphere. Valves were returned at a rate of nine every three months for a year, all in perfect condition.

The other side of the coin, but a very practical consideration withal, is the armed forces concern over maximum temperature limits. This can be understood when it is realized the mercury hits 180° F in closed boxes stored in the tropics. However, coated paper, used for some time on military consignments only with approval of procuring agency, is now blessed with a firm specification—MIL-V-8574 (Aer). This spec restricts use of VPI preservative to that applied to neutral kraft paper. It prefers use of an aluminum foil barrier wrap. Other forms of inhibitor application are still open to use with special procurement agency permission.

What About Durability?—Protection life in shelf storage at 55 to 70° F can reach 10 years, according to data established by NACE. This figure was reached by extrapolation, using results of a test in which 30-pound kraft paper coated with VPI had a metal foil barrier wrap. The same figures apply to open storage outdoors, with wind at 3 to 10 mph. Importance of proper barrier wrap is obvious when the same coated paper is used with plain kraft paper as a barrier. Here, outdoor storage life drops to a maximum 15 months; indoor shelf storage, 24 months.

If water in appreciable amounts enters the package, calculations go out the window. Solubility of inhibiting chemical means depletion will occur if water enters, contacts the paper, then drains from the package.

However, vaporization, if just a reverse-truck carton is used, will take an indefinite time. A fan blowing directly on a VPI-coated paper would have to remove 1300 cfm of air for 13 hours to dispel 70 per cent of the inhibitor's strength.

Contaminants—Where nonferrous metals enter the picture as a part of assemblies to be protected, experience has shown cadmium, zinc and lead-tin solder to be the only elements that suffer increased corrosion rates in contact with VPI. Military specification reflects this conclusion by prohibiting use of VPI on items containing these elements, adding magnesium to the list. In addition, the spec prohibits use on items that include optical systems or electrical contacts.

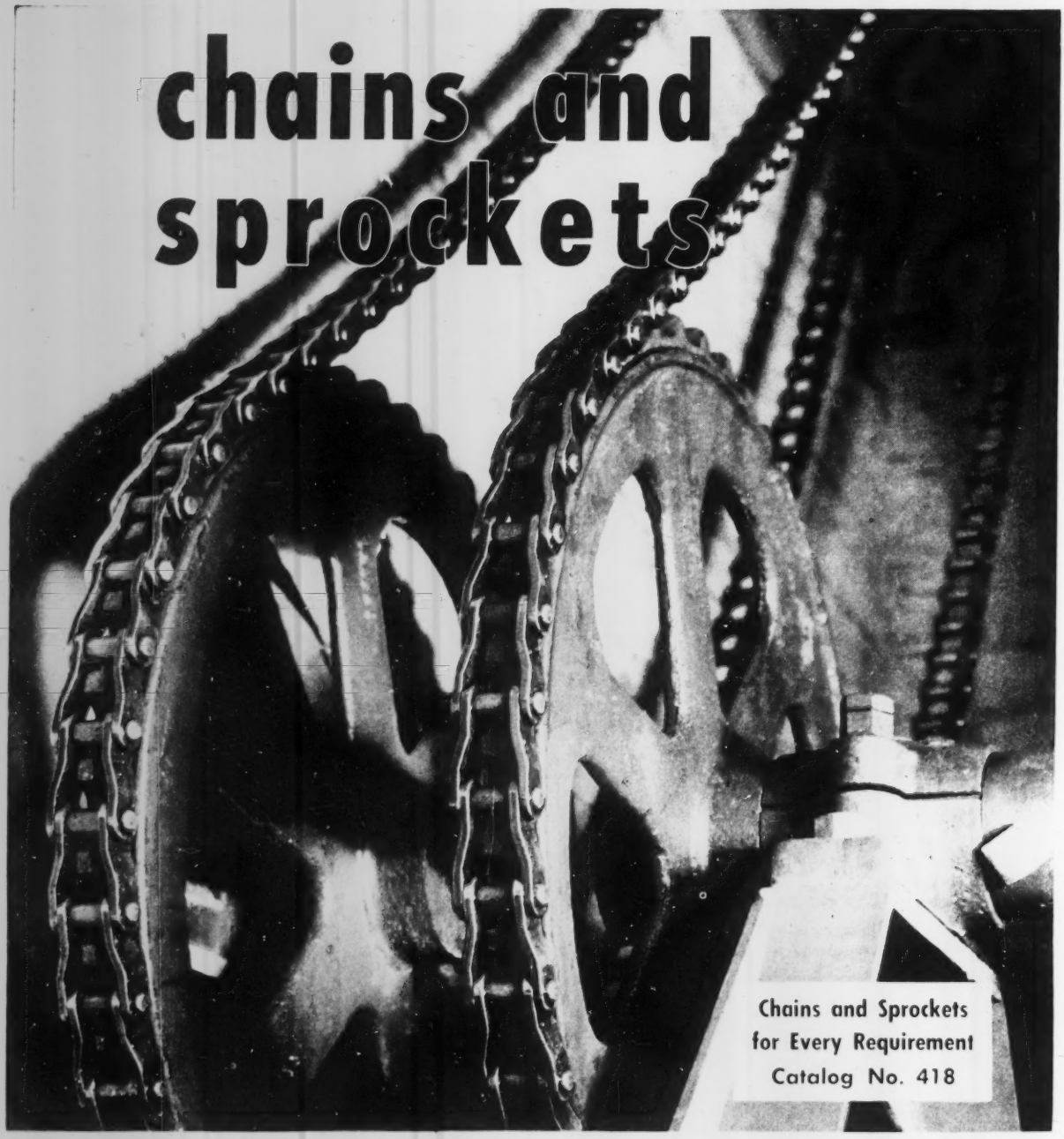
On nonmetallic materials, VPI poses little danger. One test had samples stored in a 50-gallon drum lined with paper having 1.22 grams of VPI per sq ft for a period of 24 months at about 60° F.

Materials included plastics, protective coatings, rubbers, fabrics, woods, adhesives, papers, inks, leathers and gasket materials. Marked deterioration was observed on only one type, films made from rubber hydrochloride. Mild effects that might have become more severe in a longer exposure were detected on one formation of Koroseal and on a cellulose nitrate film. Remainder of materials showed no effects other than a few on which minor color change developed.

What Next?—One drawback, especially in highly-corrosive and sensitive jobs, has been a 2-hour time lag between application of VPI and protection to parts. This has been overcome in a refinement to be announced by Shell. A new grade will offer immediate protection.

Another firm now in the field with an inhibiting compound is Nox-Rust Chemical Corp., Chicago. Nox-Rust has called its preparation Callex, but application and action are the same for inhibiting moisture through the vapor phase.

chains and sprockets



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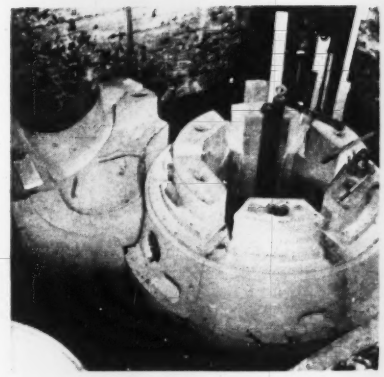


These seven cores are the first of 89 to go into a molding pit for one of the four centrifugal pump cases

Casting Pump Cases

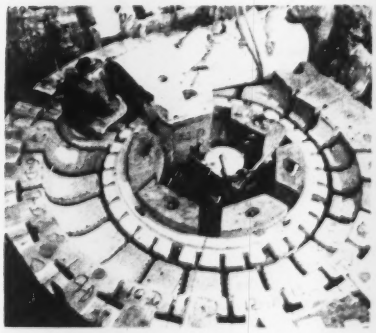
Colorado River aqueduct system provides views of some large and intricate foundry work

COMPARED with the 457-mile Colorado River aqueduct system, a single component of pumps used in this longest and largest domestic water supply line seems almost insignificant. However, many parts of this huge civil engineering project indicate important engineering and production achievements.

From a foundryman's point of view, cases of the pumps represent a large and intricate steel casting operation. According to National Supply Co., they are the largest single-piece pump castings ever produced on the West Coast.

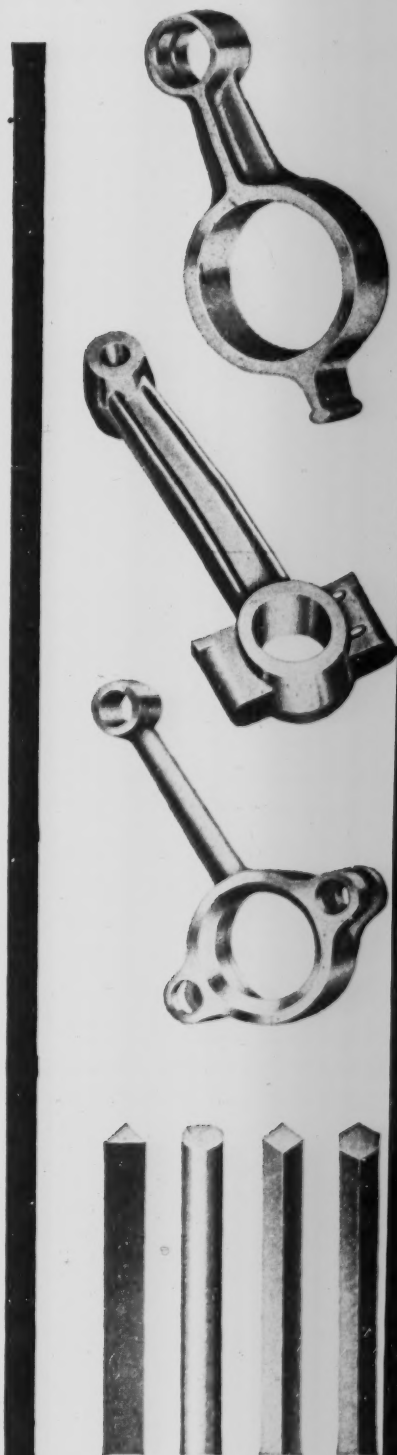
Capacity—In service, the impeller inside one of these cases lifts 90,000 gallons of water per minute to a height of 300 feet. It is driven by a 9000-hp electric motor.

With addition of four new pumps



Crane places one of the cores that will form the water passage and internal hydraulics of the pump case

TWO MILLION WITHOUT A FAILURE!



parts: small connecting rods

alloy: "600" series metal, a high strength bearing bronze that contains no tin

quantity to date: over 2,000,000

number of failures: none

forged by: Mueller Brass Co.

advantages: no bearing insert is necessary on either the wrist pin or crankshaft end because each rod acts as its own bearing. Dense homogeneous grain structure, close dimensional tolerances and high mechanical properties often permit redesigning for weight savings as high as 15% to 25%. "600" alloys have low coefficient of friction, high resistance to corrosion and tensile strength 2½ times greater than cast phosphor bronzes.

uses: compressors, outboard motors, small high speed gasoline engines. Best results are obtained if they operate against hardened, ground and polished shafts.

"600" SERIES ROD is produced in standard 12-ft. mill lengths and a wide range of sizes and special shapes. This rod has a fine, uniform grain structure and the mechanical properties are rigidly controlled in the cold drawing process. Scrap loss is greatly reduced in machining operations because of the complete absence of defects. For complete information, write us today.

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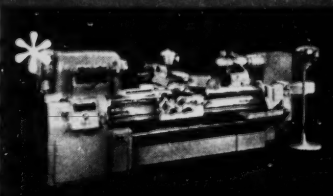
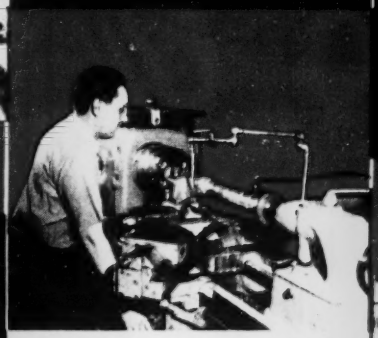
TYPICAL MEDIUM LATHE APPLICATION



Monarch 16" Series 60 Engine Lathe with Air-Gage Tracer and Auto Cycle Unit



Turning rotor drive shaft. A flat template is used for this operation but round templates may be employed if desired. Stylus operates on only 5-6 ounces of pressure.

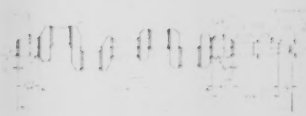
Part—helicopter rotor drive shaft, 36" long. **Material**—4340 steel forging, brought to hardness of 34 to 38 Rockwell C scale. **Operations**—finish turn and bore. **Limits**—±.001" on some diameters. **Comment**—accuracy and finish are the story here.

To obtain proper grain structure in the finished parts, the rough forgings are made substantially oversize. Finished parts average only 20% of the weight of the rough forging, and are completely free of distortion. User, having found previous modern equipment incapable of holding limits, expresses complete satisfaction with Monarch production.

TYPICAL HEAVY DUTY LATHE APPLICATION

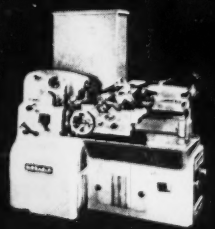
Monarch 20" Model M Heavy Duty Lathe With Type C Rigid Air-Gage Tracer

Turning crankshaft (above). Note that tool, mounted not on hydraulic slide but on its own slide, can be adjusted for diameter changes by dial calibrated in thousandths—without altering template setup.

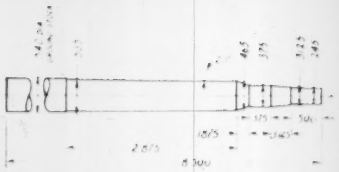


Part—crankshaft. **Material**—4140 forging. **Operations**—finish turn both ends. **Limits**—±.002". **Maximum depth of cut**—3/16". **Comment**—use of steady rest permits holding of limits, reducing spring normally present when turning such long, out-of-balance parts. With 2 cuts required on long end (above) because of large amount of stock removal from small end diameters—total turning time per piece is only 3 minutes, 5 seconds.

TYPICAL SMALL LATHE APPLICATION



Monarch 10" Model EE Precision Manufacturing Lathe with Type C Rigid Air-Gage Tracer



Part—reamer blank. **Material**—high speed steel. **Operation**—turn complete except .540" diameter. **Limits**—±.001". **Maximum depth of cut**—7/64". **Comment**—three cuts are required to avoid springing work. Yet total machining time of 3 minutes, 36 seconds was achieved at once by operator new to Air-Gage Tracer equipped machine. Customer estimates that savings will pay for machine in less than one year.

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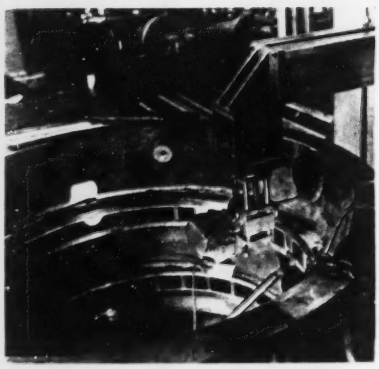
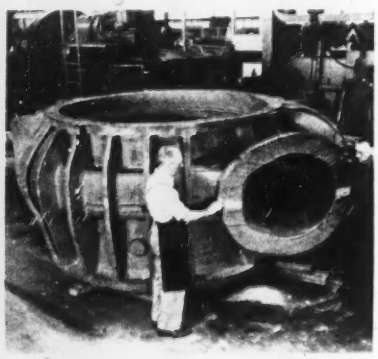


Most machining on the 38,000-pound case was done on a 7-inch spindle, floor-type horizontal milling machine

in the system, as much as 650 million gallons of water can be delivered to Los Angeles daily from the Colorado River. This is enough for 4 million persons, allowing 163 gallons per person per day. To do this, pumps have to lift the water more than 1600 feet in five steps.

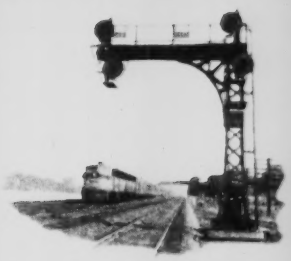
Design—Pump cases are approximately 10 feet OD, 14 feet 4 inches over discharge flange, and weigh 38,000 pounds. Although size and weight are impressive, a significant fact is that they would be much larger, heavier except for engineering design and foundry production methods that permit lower weight, high safety factor.

National Supply Co.'s plant at Torrance, Calif., best known by the oil industry as manufacturer of well drilling rigs, was pushed to its physical limit to turn out the four Byron-Jackson pump casings. An integrated setup, the plant used its own electric furnace steel, foundry and heat-treat facilities and machine shop to do the job.

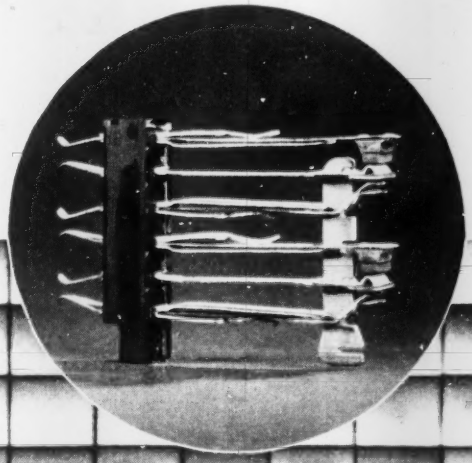


Finished casting is ready for machining after mold is removed, casting cleaned and heat treatment completed

These relay contacts



spell train safety—



Relay contact assembly showing silver-carbon contacts.

Radiograph discloses contacts with improper silver dispersion.

RADIOGRAPHY gives them the "Green Light"

RELAY CONTACTS for railway signals must have low resistance. Ideally, this would call for silver touching silver—but pure silver contacts might fuse if overloaded and the signal lock on green. Carbon contacts can avoid this but have too high resistance.

The answer lies in impregnating carbon with silver, then making sure by radiography that the silver grains are properly dispersed throughout the carbon. This provides assurance that the relay will have a non-fusing contact with low resistance.

It's another example of how radiography can prove internal soundness, whether in such a compound as this, in a casting, or a weld.

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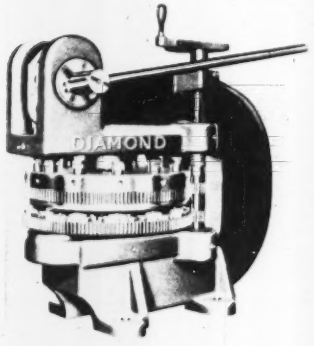
NEW PRODUCTS and equipment

Reply card on page 147 will bring you more information on any new products and equipment in this issue

Hand-Operated Turret Press

. . . has punch indexing control

Punch indexing control for automatic exact die set positioning is included in redesign of this hand-operated turret press. Punches and



dies are geared together for permanent precision alignment and lock rigidly in punch position.

The turret has a 13-inch throat and contains 12 punches and dies that are interchangeable between turret positions. Turrets are geared together with self-compensating gears to eliminate backlash. Capacity is 10 tons and the maximum punch size is 1½ inches with ⅛-inch mild steel. Diamond Machine Tool Co., Dept. ST, 5111 Coffman-Pico Rd., Pico (Los Angeles), Calif.

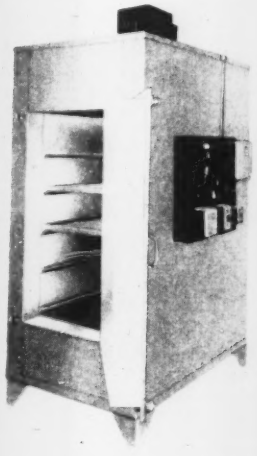
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Vertical Flow Cabinet Oven

. . . 20 per cent more insulation

Combination of features in this vertical flow oven is reported to reduce heat loss with corresponding greater efficiency and lower operating cost. These features: No metal to metal contact; double gasketed doors with heat trap; 20 per cent more insulation; high-low selective heat intensity control.

Heating elements are made of Inconel-sheathed design located in a plenum chamber. All compo-



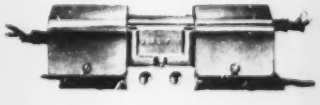
nents are readily accessible. Flow of air is adjustable. Grieve-Hendry Co. Inc., Dept. ST, 1811-19 W. Lake St., Chicago 12, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Direct Four-Way Valves

. . . compact, solenoid-operated

Two ¼-inch four-way poppet type valves are direct solenoid operated, compact and very fast. Manufacturer recommends P-M models



CC1-25 and CC11-25 for speeds as high as 600 cycles per minute. Important application is expected for electric control of small, double-acting air cylinders on short stroke, high speed jobs.

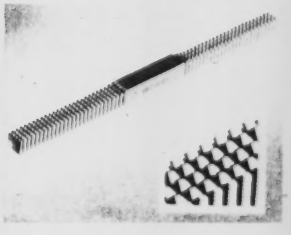
Pipe or tubing connections are made to a separate manifold, to which the valve mounts. Valve body and the solenoid can be removed for servicing by removing four cap screws, without disturbing line connections. Hannifin Corp., Dept. ST, 1101 S. Kilbourn Ave., Chicago 24, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Thread Restoring Tool

. . . without decreasing size

External threads that have been damaged or deformed can be returned quickly to original condition without reducing root and outside



diameter by this thread restoring tool. Used like a file, a few passes across damaged threads with Nu-Trix restorer remove burrs and deformed metal and reshape threads to original conditions.

Restorer is made of hardened steel, 8½ inches long, 7/16-inch square. It is available for either National Coarse or National Fine threads. Reiff & Nestor Co., Dept. ST, Lykens, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

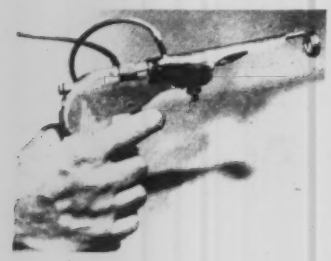
Gas Gun Attachment

. . . for fast leak detection

Attachment for the Torch-O-Matic air-acetylene gas gun is a halide leak detector that permits positive detection of halogenated gases in the air. Attachment consists of a gasketed metal saddle, a

two-turn helix of copper rod and a rubber sampling tube.

When the saddle is clipped onto the gun, venturi effect produced by acetylene flowing through the gun



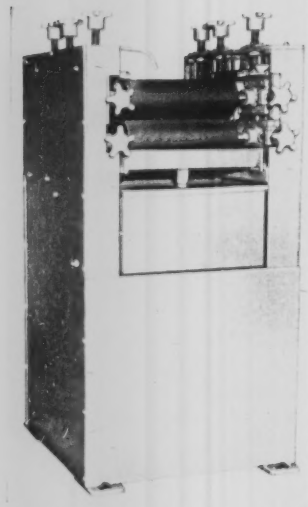
barrel creates a vacuum in the sampling tube. Air sample drawn through the tube mixes with acetylene and, as the latter burns, any halogenated gases present are decomposed. Products of this decomposition strike the hot copper helix and impart a distinctive color. Velocity-Power Tool Co., Dept. ST, 7500 Thomas Blvd., Pittsburgh 8, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Coiled Stock Coating Machine

. . . feeds material automatically

This coating machine automatically feeds material from the uncoiler, deburrs the edges, coats



both sides with drawing compound and feeds the press. Circulating pumping unit with 5-gallon sump tank, located under machine's rolls, supplies drawing compound to the doctor and coating rolls.

Machine is powered by a 1-hp motor, complete with magnetic starter and foot control. Coaters can be built to handle stock widths from 0 to 60 inches, thicknesses from 0.005-inch up. Union Tool Corp., Dept. ST, Warsaw, Ind.

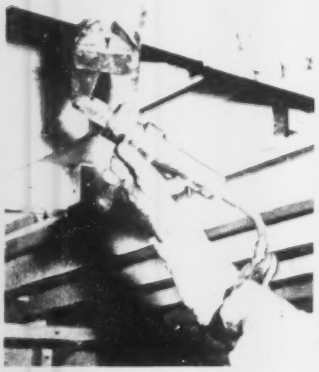
FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Hydraulic Angular Cutter

. . . for flush-trimming bolts

Hydraulic angular bolt cutter in the manufacturer's Guillotine line is designed for flush trimming bolts to the nut or for other metal trimming jobs where a close fit is required.

Cutter has a capacity for trimming ⅞-inch mild steel bolts. It



also can be obtained with cut back jaws for use in splitting nuts during wrecking operations or for trimming wire mesh. Power is supplied through a portable hydraulic pump.

The unit is actuated by a manual lever that eliminates necessity of solenoid switches. Cutting head weighs 23 pounds. Manco Mfg. Co., Dept. ST, Bradley, Ill.

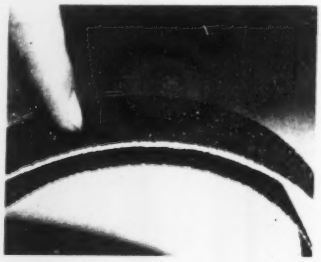
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Abrasive Cloth Belt

. . . combines glue, grain types

Heavy-coated abrasive cloth belt, Three-M-ite Multicut, combines polishing characteristics of hand-coated glue and grain setup wheels and belts. Heavy mineral buildup of the belt opens up under work pressure presenting fresh abrasive grain particles to the workpiece.

The belt is reported to retain all advantages of a factory-coated polishing member. It eliminates cost and need for making hand-coated setup products and frees manpower and space. Belt is available in grit 60 and 150 aluminum



oxide mineral in all standard widths and lengths. Minnesota Mining & Mfg. Co., Dept. ST, 900 Fauquier St., St. Paul 6, Minn.

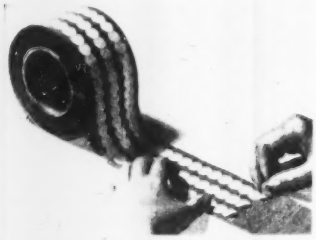
FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Spray Paint Masking Dots

. . . withstand up to 325° F

These spray paint masking discs should help hold down high cost of paint masking. Each disc is slightly overlapped by the next, so when one is removed it raises the edge of the next to provide a surface that can be grasped easily.

Discs are heat resistant, withstanding oven baking temperatures to 325° F for 30 minutes without leaving troublesome adhesive on the work. They are available in



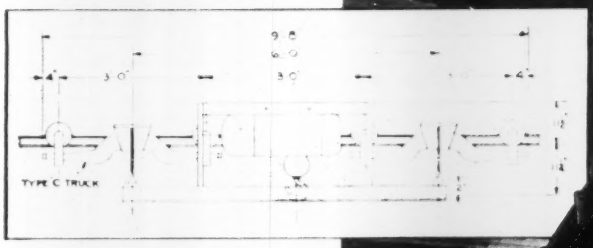
diameters from ¼ to 4 inches, in increments of sixteenths. By-Buk Co., Dept. ST, 4314 W. Pico Blvd., Los Angeles 19, Calif.

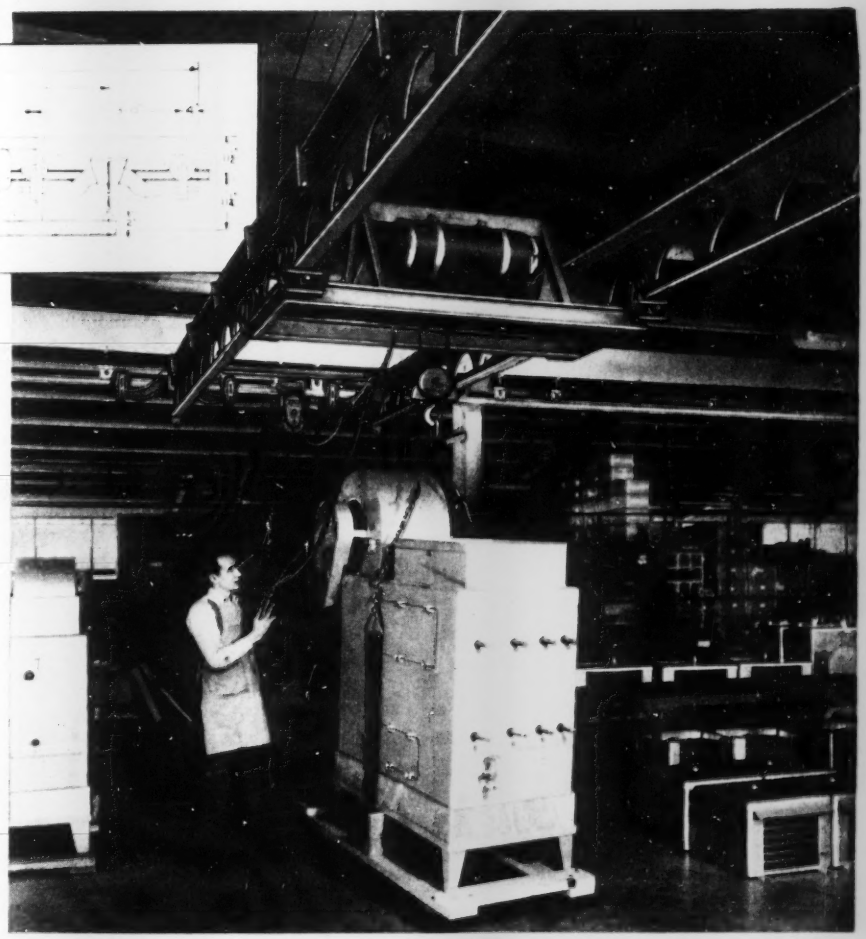
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Redesigned Motor Line

. . . built to NEMA dimensions

Line of polyphase alternating current motors is built to latest standard NEMA frame dimensions. Average size reduction of 50 per cent by volume is achieved in the Tri Clad 55 line. Motors average 22 per cent less weight per horsepower. In addition, it incorporates





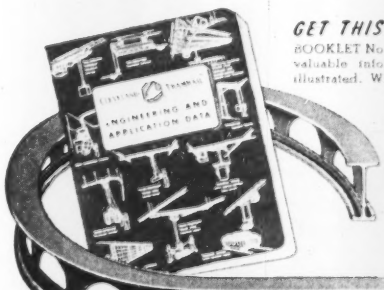
Lifting this three-ton condenser and moving it about is made an easy one-man job with the Tramrail crane.

HIGH LIFT UNDER LOW ROOF *Solves Handling Problem*

A double-girder, high-lift Cleveland Tramrail crane proved the solution of a handling problem at The Refrigeration Engineering Co., Los Angeles, Calif., manufacturers of evaporators and condensers of all sizes up to 100-ton rating.

Because many of their units are high and heavy, and the roof is very low, it was necessary to develop a special crane design that permits utilizing space between the crane girders. How well this was engineered is evidenced by the fact that while the distance from floor to the low part of the roof truss is only 11'-10¼", the hoist hook can be raised 10'-0" above the floor.

The crane and hoist are motor-driven, push-button controlled. The trolley is hand-propelled. The hoist has a capacity of three tons and travels at 18 feet per minute.



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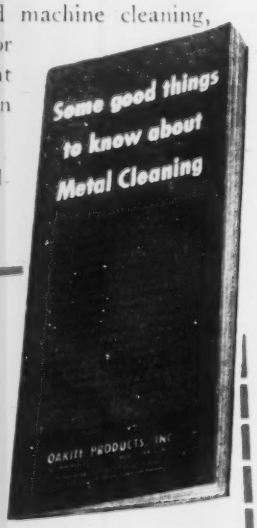

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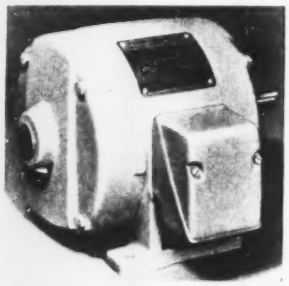


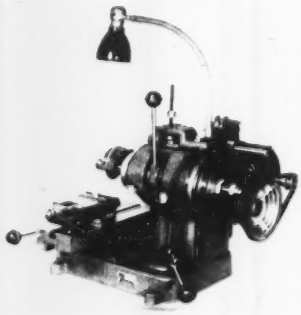
tightly sealed and is lubricated by a grease reported to last five times longer than formerly used lubricants. Protection is increased by 60 per cent on the drip-proof enclosure through end-shield and frame design. Noise level of the 10-hp motor tests as low as the former 2-hp model. General Electric Co., Dept. ST, Schenectady 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Bench Milling Machine

. . . accessories expand range

Special accessories for this bench mill make possible a greater range



of milling and machining operations. Low spindle speed drive is

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INFORMATION

AVAILABLE FOR THE ASKING

69. Steel Link Belt

Link-Belt Co.—Various types and sizes of steel link belt and its applications in light drive and conveying service are covered in 16-page book 2402. Features and advantages, attachments and dimensional data are detailed. Belt is a detachable chain of hook and bar construction formed from strip steel.

70. Pumps

Pioneer Pump & Mfg. Co.—Line of pumps described in 8-page bulletin 160-26 includes centrifugal and positive displacement types for handling coolants and lubricating oils. Installations on machine tools are illustrated along with various motor-mounting brackets, self-priming auxiliaries and separate tank units.

71. Hot Die Lubricants

Fiske Brothers Refining Co.—Brief description of hot die lubricants are given in data sheet. Lubricants are graphited products used on various forging, upsetting, extruding and forming operations.

72. Rust Preventives

Rust-Oleum Corp.—How extensive line of Rust-Oleum rust-preventives function throughout industry is told in 16-page illustrated 1953 general catalog 252. It features 23 color chips and includes instruction for surface preparation and application of the many Rust-Oleum products.

73. Solenoid Control Valve

Valvair Corp.—Speed-Ring solenoid pilot operated control valve is subject of 8-page illustrated bulletin SC-53. Design features, specifications and dimensional drawings of complete line are included. Recommended pressures are from 25 to 150 psi. Mounting in any position and life is said to be 20 million cycles plus.

74. Galvanizing Stops Rust

American Hot Dip Galvanizers Association Inc.—"Stop Rust Once and for All with Hot-Dip Galvanizing" is title of 16-page illustrated brochure which shows how rust is being combatted by hot dip galvanizing in a wide variety of applications. Processing procedure is described and a chart compares various other coatings with this process.

75. Movable Steel Partition

Virginia Metal Products Corp.—Detailed drawings and descriptions of the Underwriters' tests on the 1-hour movable steel fire partition are contained in the "Mobilfirewall" brochure. Partition offers 1-hour protection for storage and other areas.

76. Dry Cyaniding Process

Surface Combustion Corp.—Dry gas cyaniding is a process for case hardening steel in an atmosphere containing a carburizing gas with ammonia added in controlled amounts. How the process is applied in continuous and batch type furnaces of this company is related in 4-page illustrated bulletin SC-145. Some typical applications are given.

77. Double Angle Shears

King Bros. Engineering Works.—Specifications for four sizes of double angle shears are featured in 4-page bulletin No. 2345. Shear which is actually two shears in one machine, can be set up to shear round bars and bar angles on one side and structural angles and flat bars on the other.

78. Centrifugal Castings

Shenango-Penn Mold Co.—Centrifugal Castings Div.—Two 6-page illustrated bulletins, Nos. 150 and 151, present information on the various types of nonferrous and Mechanite, Ni-Resist and special iron alloy centrifugal castings made by this company. Machining facilities are covered.

STEEL
Penton Building, Cleveland 13, Ohio

10-26-53

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2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
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79. V-Belts

Dodge Mfg. Corp. Multiple V and FHP belts are subject of 8-page illustrated bulletin 5787. In addition to showing belt features and construction, bulletin provides conversion tables showing correct Thousand belt for a given application and gives prices, dimensions and weights.

80. Chemical Steel Polish

Du Dermal Inc. Data sheet No. 22 describes MirroFe, a room temperature chemical steel polish that with a minute immersion produces a finish equivalent to a 30-minute operation of bright nickel. It imparts a slight corrosion resistance and is useful also for building dies to give longer life.

81. Couplings & Converters

Twin Disc Clutch Co. "Coupling or Converter" is title of 32-page well-illustrated booklet designed to explain respective merits of the two transmissions and indicate where each can best be used. Booklet is written with minimum of technical jargon and shows many application photographs.

82. Conveyors

Standard Conveyor Co. Many different types of industrial conveyors are featured in the 16 illustrated pages of bulletin 68. They include gravity, power and pneumatic tube systems for all sorts of service. Photocaption treatment gives clear, quick picture.

83. Displacement Gas Meters

Dresser Industries, Inc., Roots-Connersville Blower Div. Meters for measuring gases of any type and in quantities from 1000 to 1 million cubic ft/hr are subject of 16-page booklet M-152. Various meter types are shown and a selection table determines correct meter for any requirement.

84. Coal Tar Tape

Tapecoat Co. Coal tar treated tape for protection of industrial pipelines in corrosive conditions is subject of 8-page illustrated brochure. Illustrations of applications in gas and oil, water, sewage, chemical, industrial and other fields are shown. A complete size range of tape is available for all pipe sizes.

85. Blast Cleaning Barrel

Pangborn Corp. Eight construction features of the Blastmaster Rotoblast are illustrated in 12-page bulletin No. 223. It points to production savings possible with this machine designed for the newer abrasives to batch blast rocking castings and heat treated parts. Sizes for both 6 and 12-in. ft capacity shot barrel tilt into charging position.

86. Gas Cylinders

Taylor-Wharton Iron & Steel Co. High pressure steel cylinders for storage of various gases are pictured subject of 8-page illustrated bulletin. Fabrication methods are described, with available sizes and service pressure ranges. Working pressures range up to 2100 psi. Other company products such as railroad track drilling buckets and crusher roll segments shown.

87. Hydraulic Duplicators

Tracer-Follower Machine Co. 20-page illustrated bulletin devoted to the Tracer hydraulic duplicating attachment for milling machines, lathes, shapers and grinders. Various models are pictured and described together with machining applications.

EDITORIAL ARTICLES

Available in Limited Quantities

88. Right Metal for Job

What is new to meet each job in the budget and do may be several years away from practical use. Materials engineer. With this in mind STEEL offers in limited quantity the article "Select the Right Metal for the Job" which appeared in the Oct. 12, 1953 issue. Subjects which make up the comprehensive treatment are headlined "Must Strength Be Weight?" "Machinability" "Hardenability" "Ductile Iron" "Stainless Steels" "Clad Steels" "Coverage of Metals" and "Copper Alloys."

89. Metal Behavior

Research offers new insight into such matters as behavior of metals at high temperatures. The practical rule is that strength tends to increase as temperature falls. Five recent developments among the subjects cited in STEEL article "Material and Low Temperatures."

90. Continuous Casting

In STEEL article "Status Report on Continuous Casting" W. P. Dean of Allegheny Ludlum Steel Corp. takes stock of progress made in four years' use of this method to melt. With most of the kinks ironed out, company manager of continuous process has a healthy infant.

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developed for slitting and straddle milling. In addition to standard spindle speeds of 1000, 1725 and 3000, nine new speeds are available in a range from 214 to 768 rpm.

Special stub arbors are available to take standard high speed steel or carbide slitting saws and cutters. Also included among the accessories are 2-inch riser blocks with bolts to raise the column and head where special fixtures require it, and a 3¼-inch graduated swivel base vise. Barker Engineering Co., Dept. ST, 500 Green Rd., Cleveland 21, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Expanded Live Center Line

. . . accuracy of 0.0001-inch

This live center is equipped with No. 3 Timken bearings having guaranteed accuracy of 0.0001-inch. Interchangeable points are

available in a wide variety of sizes for standard male, long male, standard female and standard pipe points. Centers are positive sealing against foreign matter.

Means of lubrication are provided by ⅛-inch pipe thread and shank

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Abrasive Belts

for grinding, sanding, polishing — metal, wood, leather, plastics, rubber.

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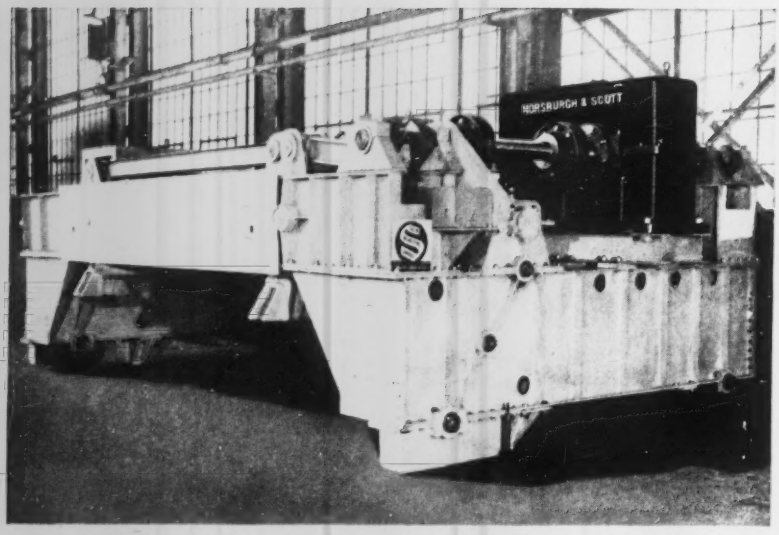
South Braintree 85, Massachusetts

Giving a lift to 56,000 pounds of



soaking pit cover through . . .

H&S REDUCERS

• The above photograph shows a soaking pit cover crane designed and built by Salem-Brosius, Inc. Two Horsburgh & Scott Helical Speed Reducers are used on each crane...the lift drive handles a cover weighing about 28 tons and operates at a speed of 6' per minute...the traverse drive moves the crane at a speed of 88' per minute. Many of these cranes have been operating very satisfactorily for twelve to fifteen years...actual tribute to complete engineering design.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

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Send note on Company Letterhead for Speed Reducer Catalog 46

NEW PRODUCTS and equipment

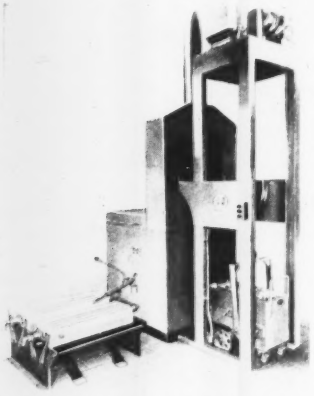
of center. Standard Alemite or other grease fittings can be applied. Royal Products, Dept. ST, 82 Union St., Mineola, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Soft Metal Melting Unit

. . . has automatic loader

An automatic loading device, the Meltevator, is available with this metal remelter. Result of its use is to make the remelting operation almost entirely automatic. Standard



models are available with pot capacities from 600 pounds to 5 tons. The unit handles such metals as babbitt, solder, tin, zinc, lead and lead alloys.

Loading device is designed for adaptation to remelt furnaces of any type. Trucks containing metal to be melted are rolled into the loader, where bosses on the side of the truck are engaged by hoisting mechanism. Truck is elevated and load dumped through a counter-balanced trap door into the crucible. Nolan Corp., Dept. ST, Rome, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

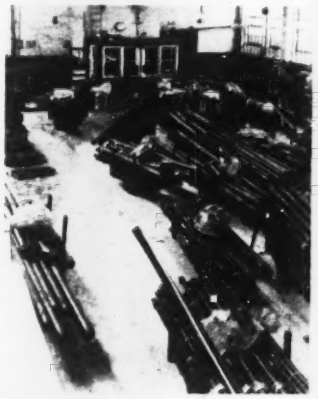
Concrete Resurfacer

. . . repairs to feather edge

Ruggedwear Firmflex resurfacer is a tough concrete patching material suited for a variety of floor repair jobs. As a patch, this material can be applied without chipping or chopping and bonds securely to the old concrete up to a feather edge. Surface will not grind away dust or crack.

The surfacer is also used as a complete overlay on almost any

type of floor. Installed at ½-inch average it requires no wet curing



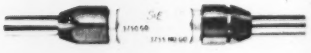
and sets up crack-free in 18 to 20 hours. Flexrock Co., Dept. ST, 3630 Filbert St., Philadelphia 1, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Bigger Carbide Plug Gages

. . . diameters to 0.760-inch

This company has extended its line of tungsten carbide reversible plug gages beyond the customary 0.510-inch American Gage Design Standard maximum to 0.760-inch



diameter. Result is convenience and economy obtainable by reversing gaging members to increase useful gage life to gages in the 0.510 to 0.760-inch diameter range which would ordinarily be fabricated in nonreversible taper-lock design.

Gaging members are ground and lapped to exacting finish and size and are available in tolerance classes XX, X, Y and Z. S & E Machine Products Inc., Dept. ST, Bridgeport, Mich.

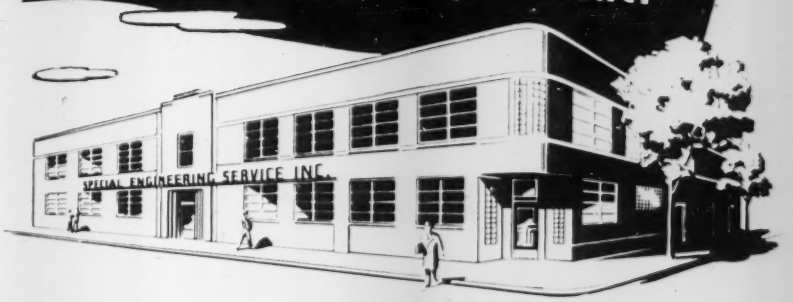
FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Brush-On Floor Paint

. . . prevents slipping, skidding

This floor paint, called Sure-Grip, is a plastic fluid into which is incorporated a considerable amount of grit of near-diamond hardness

Here's a Valuable Supplement to your own Engineering Department!



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WITH METHODS AND DESIGN

"hidden strength to give maximum support and stability"

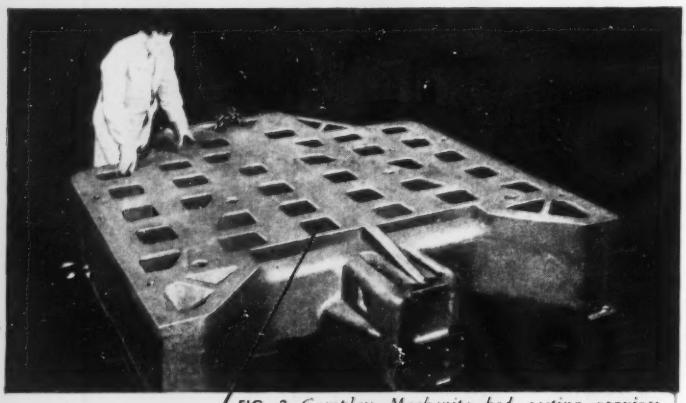

FIG. 2 *Complex Meehanite bed casting requires better properties, superior foundry control.*

Meehanite Castings Specified

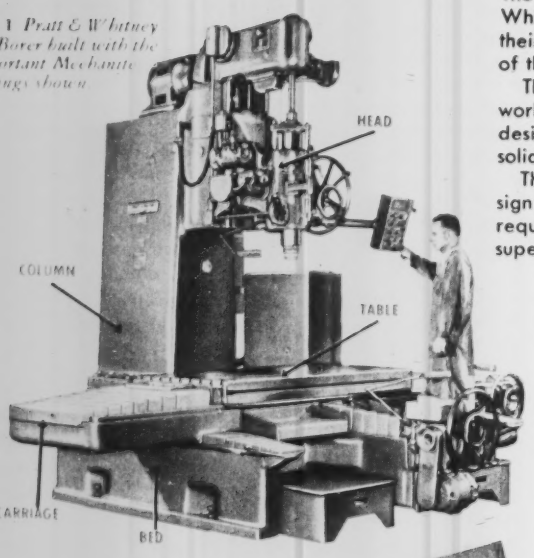

FIG. 1 *Pratt & Whitney Jig Borer built with the important Meehanite castings shown.*

The headline above is a direct quotation. This is what Pratt & Whitney, Division Niles-Bement-Pond Company have to say about their reasons for specifying Meehanite castings for the components of the No. 4E Jig Borer shown in Fig. 1.

The importance of these castings in maintaining accuracy with work loads up to 5,000 pounds is obvious. Each must be properly designed to meet these demands—high strength, uniformity and solidity are essential.

The bed casting shown in Fig. 2 illustrates the complexity of design required for this machine tool. Production of units of this type requires a high degree of control of all foundry process plus the superior engineering properties available in Meehanite castings.

For other applications of Meehanite metal in the Machine Tool Industry, write for a copy of this bulletin. Among its 24 pages you will find many applications which may be of help to you.

MEEHANITE FOUNDRIES

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington and Dover, New Jersey
E. W. Bliss Co.	Hastings, Mich. and Toledo, O.
Builders Iron Foundry	Providence, Rhode Island
Compton Foundry	Compton, Calif.
Continental Gin Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
M. H. Detrick Co.	Newark, N. J. and Peoria, Ill.
Empire Pattern & Foundry Co.	Tulsa, Oklahoma
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Hardinge Company, Inc.	New York, New York
Hardinge Manufacturing Co.	York, Pennsylvania
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kanawha Manufacturing Co.	Charleston, West Virginia
Koehring Co.	Milwaukee, Wisconsin
Lincoln Foundry Corp.	Los Angeles, California
London Concrete Machinery Co., Ltd. (Hartley Fdry.)	Brantford, Ontario
E. Long Ltd.	Orillia, Ontario
Otis Elevator Co., Ltd.	Hamilton, Ontario
Palmyra Foundry Co., Inc.	Palmyra, New Jersey
The Henry Perkins Co.	Bridgewater, Massachusetts
Pohlman Foundry Co., Inc.	Buffalo, New York
The Prescott Co.	Menominee, Mich.
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Sanith Industries, Inc.	Indianapolis, Ind.
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
Valley Iron Works, Inc.	St. Paul, Minnesota
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey

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that produces nonslip, nonskid surface. It is many times thicker than conventional floor paint, establishing traction that prevents falls, even when wet.

Paint is brushed on in one coat,

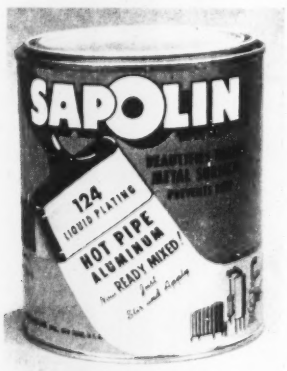
requires no primer and is equally effective over wood, metal or concrete. Covering is available in red or gray, is fully resistant to oil, grease, alcohol or water. It dries in 10 hours in normal room temperature. Colonial Refining & Chemical Co., Dept. ST, NBC Bldg., Cleveland 14, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Brush-Applied Aluminum Plate

. . . can withstand 1200 F

You can aluminum plate all high-heat metal surfaces with a simple brush-on application method. This fast drying aluminum paint, applicable for plating burners, stoves,



hot pipes, radiators and other metal surfaces, can withstand temperatures to 1200° F without discoloring or blistering. A one coat application prevents rust, cracking or peeling.

The finish actually fuses with the metal as temperatures are increased. Ready-mixed, it can be applied with brush or spray, dries hard in 30 minutes. Sapolin Paints Inc., Dept. ST, 229 E. 42nd St., New York City 17, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Lighter Arc Welder

. . . 110-pound weight reduction

Direct current arc welder is reported small, light, easy to maintain and convenient to operate. Heart of the unit consists of two parts—a selenium rectifier which converts alternating current to direct current, and a Transactor unit which controls voltage and current.

Manufacturer reports the welder is about 110 pounds lighter than its previous models. Almost all parts, with exception of unit coils and rectifiers, are interchangeable with welders of similar models but different ratings. Westinghouse Electric Corp., Dept. ST, Pittsburgh, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

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SEAMLESS • PRESSURE • MECHANICAL
CARBON STEEL TUBES
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SIZE RANGE — WALL THICKNESS

Globe seamless carbon steel tubes are available in a size range of ½ inch to 7½ inches O.D.; wall thickness of .028 to 1.000 inch.

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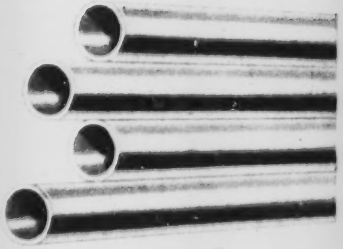
Globe Pressure Tubes are used for boilers, condensers, heat exchangers and process equipment. They meet most exacting demands of modern high pressure and high temperature installations.

Globe Mechanical Tubing (seamless) is produced by piercing solid billets. It is an ideal material for low-bearing structural members and parts where strength with minimum weight is needed. Its economy for the manufacturing of many machine parts is universally recognized.

Globe seamless carbon steel tubes are furnished to standard specifications in low and medium carbon ranges.

When you specify Globe you are sure of uniform high quality carbon steel tubes. That's because they are the product of highly developed production facilities and specialized quality controls and methods.

Globe engineers are at your service to assist in the selection of tubing of the exact characteristics you require.



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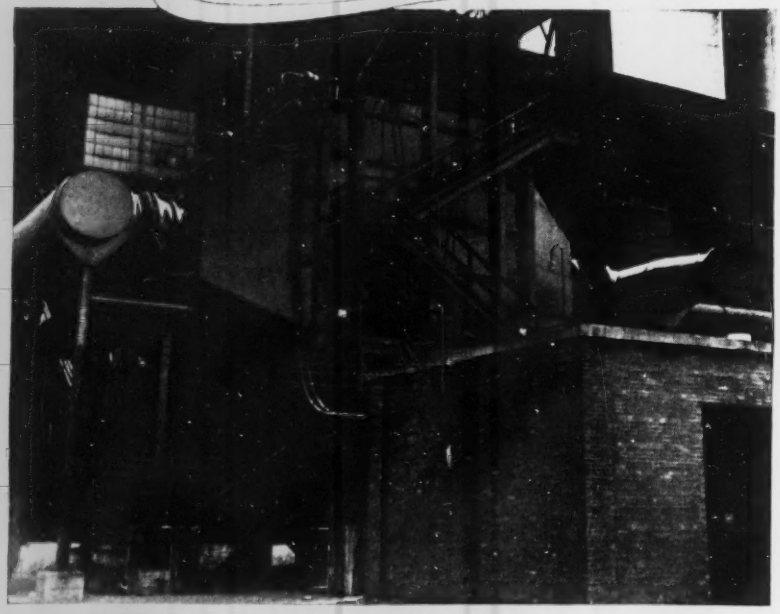

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60" x 48" Bailey Valve.

Totally enclosed 6" Valve.

Regardless of the length of time between operations, these valves operate instantly to provide a tight seal for shutting off gas mains. They require a minimum of maintenance and operate by a powerful clamping force applied equally at all points around disc periphery. Sizes from 6" to 72", totally enclosed if desired.

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CALENDAR
OF MEETINGS

October 26-27, National Association of Suggestion Systems: Annual convention, William Penn hotel, Pittsburgh. Association address: 122 S. Michigan Ave., Chicago 3.

October 26-28, National Lubricating Grease Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute address: 4638 J. C. Nichols Parkway, Kansas City 12, Mo. Secretary: Harry F. Bennetts.

October 26-29, American Gas Association: Annual convention, Kiel Auditorium, St. Louis. Association address: 420 Lexington Ave., New York 17. Secretary & convention manager: Kurwin R. Boyes.

October 28-30, American Society of Body Engineers Inc.: Annual technical convention, Rackham Memorial Bldg., Detroit. Society address: 100 Farnsworth Ave., Detroit 2. Assistant secretary: Walter Holding.

October 28-30, American Management Association: Conference on manufacturing, Bellevue-Stratford hotel, Philadelphia. Association address: 330 W. 42nd St., New York 36. President: Lawrence A. Appley.

October 29-30, National Industrial Conference Board Inc.: Special conference on atomic energy, Hotel Waldorf-Astoria, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

October 29-30, Society of Automotive Engineers: International production meeting, Royal York hotel, Toronto, Ont. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

October 29-30, American Foundrymen's Society, Michiana and Central Indiana Chapters; and Purdue University, Dept. of General Engineering: Metals casting conference, Memorial Union Bldg., Purdue, W. Lafayette, Ind. Information: C. T. Marek, Dept. of General Engineering, Purdue University, W. Lafayette, Ind.

October 29-30, American Society of Mechanical Engineers and American Institute of Mining & Metallurgical Engineers: Annual joint fuels conference, Conrad Hilton hotel, Chicago. Information: J. R. Michel, Commonwealth Edison Co., 72 W. Adams St., Chicago 90.

October 29-November 1, Automotive Parts Rebuilders Association: Fall meeting and exhibit, Hotel Sherman, Chicago. Association address: 220 S. State St., Chicago 4. Executive secretary: Jack O'Sullivan.

October 30, Eastern States Blast Furnace & Coke Oven Association and Blast Furnace & Coke Oven Association of the Chicago District: Annual joint meeting, Hotel Statler, Cleveland. Information: J. E. Allen, Central Fes. & Docks., American Steel & Wire Div., U. S. Steel Corp., 2650 Broadway Ave., Cleveland 13.

October 30-31, Industrial Council on Development of Electrical Manufacturing Industry: Rensselaer Polytechnic Institute, Troy, N. Y. Information: Dr. Ray Palmer Baker, Director of the Industrial Council, Rensselaer Polytechnic Institute, Troy, N. Y.

October 30-31, American Society of Tool Engineers: Semi-annual board meeting, Dayton Biltmore hotel, Dayton, O. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: H. E. Conrad.

October 30-31, Southern Ohio Section, National Open Hearth Committee, American Institute of Mining & Metallurgical Engineers: Fall meeting, Deshler-Hilton hotel, Columbus, O. Committee address: Rm. 912, 26 W. 39th St., New York 18. Secretary-treasurer: Ernest Kirkendall.

November 1-6, American Society of Sanitary Engineering: Annual meeting, Hotel Hollenden, Cleveland. Society address: 4716 Ewing Ave. S., Minneapolis. Secretary: Walter A. Dunn.

November 2-3, Magnesium Association: Annual meeting, Biltmore hotel, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: Martha I. Hansen.

November 2-4, Society of Automotive Engineers: National transportation meeting, Hotel Conrad Hilton, Chicago. Society ad-

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BARS?

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- *All materials cut to your exact specifications*
- *All materials available at published prices*
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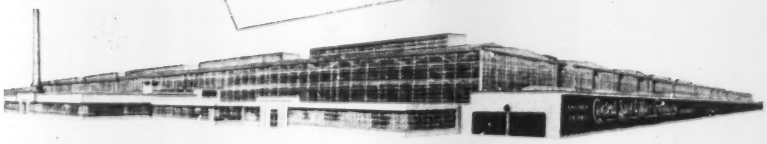

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SPEED ALLOY helps build
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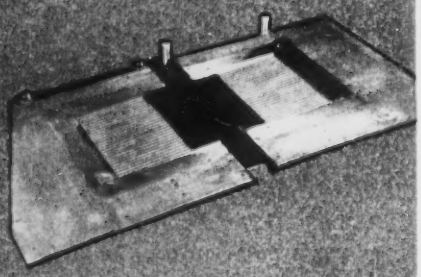
ALLOY DIES MADE OF SPEED ALLOY PLATE

YOUTH "of all ages" gather about these gleaming dispensers of delectables manufactured by Grand Rapids Cabinet Co., Grand Rapids, Michigan.

Stainless steel throughout, the corrugated sink drainboard is formed in carburized and hardened dies machined from Speed Alloy Steel Plate. This steel bridges the gap between carbon and tool steels, is easier to machine, readily hardened and is ideal for many medium run dies.



Several hundred parts are formed each season by the die shown which exerts 650-tons pressure. Note the high lustre finish obtained by using Speed Alloy. Waite Tool & Die Co., Grand Rapids, who use Speed Steels extensively for dies and molds, made these dies as well as several others for the same fountain manufacturer.

It will pay you to investigate the advantages of Speed Steels—Speed Case (X1515), Speed Treat (X1545) and Speed Alloy. Send for literature.

Speed Steels

SINCE 1856
W. J. HOLLIDAY & CO.
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Produced by W. J. Holliday & Co., Inc., Speed Steel Plate Division, Hammond, Indiana; Plants: Hammond and Indianapolis, Indiana

dress: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 2-6, American Institute of Electrical Engineers: Fall general meeting, Hotel Muehlebach, Kansas City, Mo. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

November 2-6, National Association of Manufacturers: Institute on industrial relations, The Greenbrier, White Sulphur Springs, W. Va. Association address: 14 W. 49th St., New York 20. Information: Sybyl S. Patterson, Director, Employee Relations Division, National Association of Manufacturers.

November 3-4, Society of Automotive Engineers: National diesel engine meeting, Hotel Conrad Hilton, Chicago. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 4-6, American Society for Personnel Administration: Annual meeting, Chase-Park-Plaza hotel, St. Louis. Society address: Box 1413, Milwaukee. Treasurer: Bud Bitters.

November 4-6, Steel Founders' Society of America: Annual T & O Conference, Hotel Carter, Cleveland. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

November 4-6, Annual Meehanite Research Meeting: Hotel Cleveland, Cleveland. Information: C. R. Austin, Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.

November 5-6, Annual Pittsburgh Diffraction Conference: Mellon Institute of Industrial Research, Pittsburgh. Information: Dr. H. R. Letner, Mellon Institute, Pittsburgh 13.

November 5-6, Steel Products Warehouse Association Inc.: Annual meeting, Statler hotel, Washington. Executive secretary: James I. Dougherty, 725—15th St. NW, Washington.

November 5-6, Society of Automotive Engineers: National fuels and lubricants meeting, Hotel Conrad Hilton, Chicago. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 6, American Iron & Steel Institute: San Francisco regional technical meeting, Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Secretary: George S. Rose.

November 9-12, American Petroleum Institute: Annual meeting, Hotels Conrad Hilton and Palmer House, Chicago. Institute address: 50 W. 50th St., New York 20. Secretary: Lacey Walker.

November 9-12, The Wire Association: Annual convention, La Salle hotel, Chicago. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 9-12, Refrigeration Equipment Manufacturers Association: Refrigeration & air conditioning exposition, Public auditorium, Cleveland. Information: Banner & Greif, 18 E. 41st St., New York 17.

November 9-13, National Electrical Manufacturers Association: Annual meeting, Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Managing director: W. J. Donald.

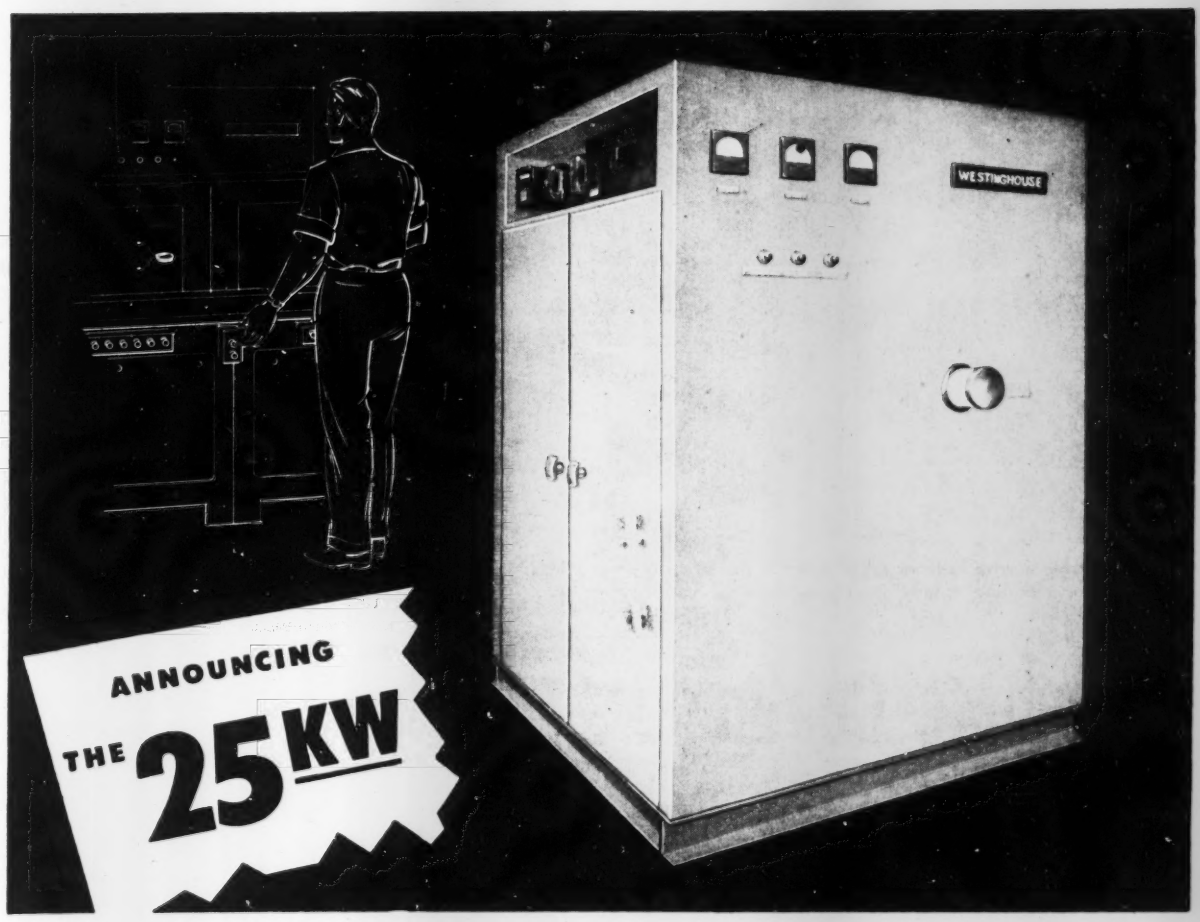
November 9-13, Montreal Chapter, American Material Handling Society and Foremen's Club of Montreal: Combined materials handling and tool and equipment show, Show Mart Bldg., Berri Square, Montreal. Information: E. M. Wilcox, Ltd., 4585 Sherbrooke St. W., Montreal, Quebec.

November 12-13, Porcelain Enamel Institute and Building Research Advisory Board: Conference on porcelain enamel in the building industry, National Academy of Sciences, Washington. Information: Building Research Advisory Board, National Research Council, 2101 Constitution Ave. NW, Washington 25.

November 13-18, National Association of Waste Material Dealers Inc.: Fall meeting, Hollywood Beach hotel, Hollywood-by-the-Sea, Fla. Association address: 271 Madison Ave., New York 16. Managing director: Clinton M. White.

November 15-18: Scientific Apparatus Makers Association: Fall meeting, The Cloister, Sea Island, Ga. Association address: 20 N. Wacker Dr., Chicago 6. Executive vice president: Kenneth Andersen.

November 18-19, National Metal Trades Association: Fall meeting, Hotel Statler, Cleveland. Association address: 122 S. Michigan Ave., Chicago 3. Commissioner: Charles L. Blatchford.



NEW HF INDUCTION HEATING GENERATOR

PUTS FULL POWER INTO A WIDER VARIETY OF LOADS

Westinghouse now presents a new high-frequency generator with 25 KW output at 100% duty cycle. For optimum performance, the new 25 KW has a tank kva of 1620. This means you can now put full power into a wider variety of loads . . . even where close coil coupling is impractical. Non-ferrous materials, like brass, copper and aluminum, can be heated in much shorter time. You benefit in higher production rates at lower costs.

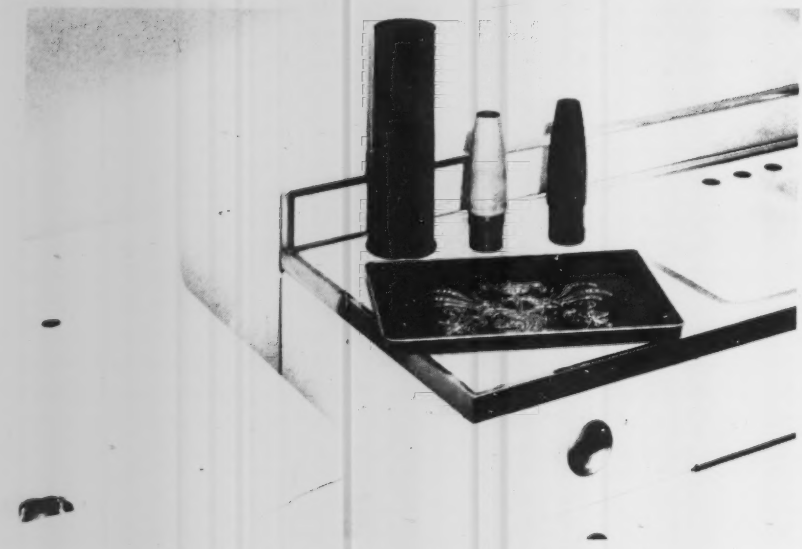
This latest addition to the Westinghouse line of induction heating tools has many more outstanding benefits. Here are some of them:

- Allows positive, precise heat control of short production runs on a variety of jobs . . . or long production runs with rapid heat cycles. The built-in electronic keying of power output that makes this possible also eliminates main contactor arcing.
- Provides smooth variation of power output from 25% to 100%. This simplified power output system utilizes dependable, maintenance-free saturable reactors and longer-life, cost-cutting diode rectifier tubes.
- Gives complete protection against condensation and water-impurity troubles. The built-in distilled water cooling system and heat exchanger offers substantial raw water economy, too.
- Assures long tube life, peak performance and minimum maintenance by close regulation of filament voltages.
- Offers easy inspection and maintenance through the full-opening double doors, easier operation through a simplified combination of conveniently located controls.

The new Westinghouse 25 KW RF Generator is available now in this de luxe model. A standard model is also available with electronic keying and smooth power output control features as easily-installed optional accessories. Both models offer flexible, economical handling of hardening, annealing and metals-joining jobs. For full information write: Westinghouse Electric Corporation, Electronics Division, Induction Heating Section, 2519 Wilkens Avenue, Baltimore 3, Maryland.

YOU CAN BE SURE... IF IT'S **Westinghouse**

J-02270



Typical applications of Pennsalt's new Fosbond products for cleaning and applying phosphate coatings to steel

Phosphate Coating . . .

EXTRA STEP IS SHORTCUT TO QUALITY FINISHES

Porous buffer zone holds organic finishes, prevents rusting or confines it to exposed surfaces and provides cushion that is flexible enough to resist impact and bending

MANUFACTURERS of metal products are finding that an extra-step phosphate coating prior to painting is a shortcut to quality.

Reaction of the phosphating solution with metal sets up a non-metallic, non-conductive, crystalline buffer zone between paint and metal.

Porous, go-between coating: 1. Links up tightly with organic finishes and holds them securely. 2. Prevents rusting by shutting out air or moisture and confines corrosion to surfaces exposed by dents or scratches and 3. Provides a cushion flexible enough to resist severe impact and bending.

Representative line of coating processes is offered by Pennsylvania Salt Mfg. Co., Philadelphia, a newcomer to the field. Its zinc phosphate, iron phosphate and phosphoric acid base Fosbonds can be applied to steel surfaces by spraying or immersion. Other processes are available to treat zinc and aluminum surfaces.

Why Phosphate?—Painted metal surfaces in a corrosive atmosphere may fail in two ways. If adhesion is poor, cured paint film may pull away from the metal surface, although it remains continuous. Loosened film is susceptible to flaking.

Second cause of failure is undercutting or creeping corrosion from areas where film has been broken. Rust at exposed surfaces soon spreads beneath the paint film, destroying adhesion between the paint and the metal over a wider and wider area. Peeling or flaking results.

Life Saver—Coating that provides desired protection for painted metal surfaces is generally a zinc, iron or manganese phosphate. In all cases, three distinct crystal layers are formed. If steel is coated with zinc phosphate, layer next to the metal consists of ferrous phosphate formed by reaction of steel with phosphoric acid in the phosphatizing solution; next layer consists of co-crystallized ferrous and zinc phosphate; third is made up of crystals that are essentially zinc phosphate admixed with small quantities of iron phosphate.

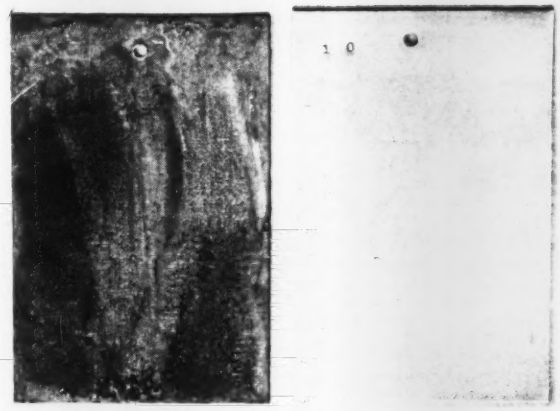
While crystals are large in number, thickness of the phosphate layer ranges from 0.00004 to 0.0002 inch. Deposit is accurately described as porous, although 99.5 per cent of the crystals do not penetrate to the metal surface.

Booster—Compound containing titanium, called Actidip, refines crystal size, lowers coating weights, improves adherence of finish to metal and resistance to corrosion. Colloidal solution is formed when compound is added to water.

Although the mechanism is not understood, it is believed that metal dipped into the suspension is coated with an absorbed film of titanium or titanium salts. Film promotes crystallization. Compound is generally used in the immersion cycle, where crystals formed tend to be larger than those produced in the spray cycle. Major application is with zinc-based products.

Mechanism—Zinc and iron phosphates are generally used on steel surfaces. In both instances, first action is pickling of the steel. When the surface of the metal becomes covered with a continuous phosphate coating, further pickling is prevented and the process stops. In modern baths, phosphatization usually stops within 10 minutes, while the bulk of the coating is obtained within 5 minutes. Of course, this depends upon the nature of the steel and other variables.

Second consequence of pickling is that ferrous iron is dissolved and accumulates in the solution. In most baths of the divalent metal type, an oxidizing agent is present to convert ferrous phos-



Soiled plate is in as-received condition. Next step is phosphate coating, right, followed by painting

Coating panels subjected to bend test to determine if the paint bonded surface will fracture under stress

phate to the less soluble ferric phosphate, which precipitates to form the bulk of the sludge.

Zinc Phosphate — Briefly, the zinc phosphate type of bath contains divalent metals, such as iron, zinc or manganese, with these cations becoming part of the coating. Its deposition takes place due to an upset in the chemical balance of the solution at the surface of the steel being treated.

Initial pickling action reduces hydrogen ion concentration and results in reduced solubility of the phosphate, and a supersaturated solution is formed in the layer next to the metal surface. If degree of supersaturation is not excessive and receptive surfaces are available, the phosphate crystallizes at the crystal planes of previously deposited phosphate.

Because deposition starts at random at any available crystal face and is then completed in that position, new crystals form in a zig-zag pattern, which results in porosity.

Iron Phosphates—This bath is composed essentially of sodium acid phosphates. Alkali metal (sodium) does not enter into the coating in this system. Bath also operates at a pH range of 3 to 6, which is appreciably higher than the zinc phosphate bath.

Steel provides iron for the coating. Ferrous phosphate coating is obtained on the metal together with ferric phosphate, which is deposited as sludge. Coatings are relatively thin. This quality is due, in part, to limited exposure in the bath and mild initial pickling before coating cycle begins. Added feature is that sludge is appreciably less than that which is obtained in a zinc phosphate bath.

Cleaners—Before metal can be treated with a phosphate coating, it must be clean. All soils, including oils, drawing compounds, loose dirt, rust and scale, must be removed before a satisfactory coating can be produced.

Oxidants — Historically, phosphatizing could not be used in conveyorized and automatic line finishing operations until treatment time could be reduced and thin crystalline coatings could be produced. First successful attempt in this direction was the incorporation of small amounts of copper salts in the phosphate bath. This shortened processing time to 10 to 15 minutes and resulted in finer and thinner coatings, which were suitable for synthetic organic finishes. But inclusions of metallic copper in the coating set up a galvanic cell, which accelerated rusting.

Today, best known oxidants include nitrates, nitrites, chlorates and mixtures of them. They depolarize hydrogen and remove hydrogen blanket from metal surfaces.

The processing time is in 3 to 7-minute range. Oxidants also oxidize soluble ferrous iron, which is precipitated as insoluble ferric phosphate, to stabilize the phosphate bath.

FIVE-STAGE SPRAY CYCLE

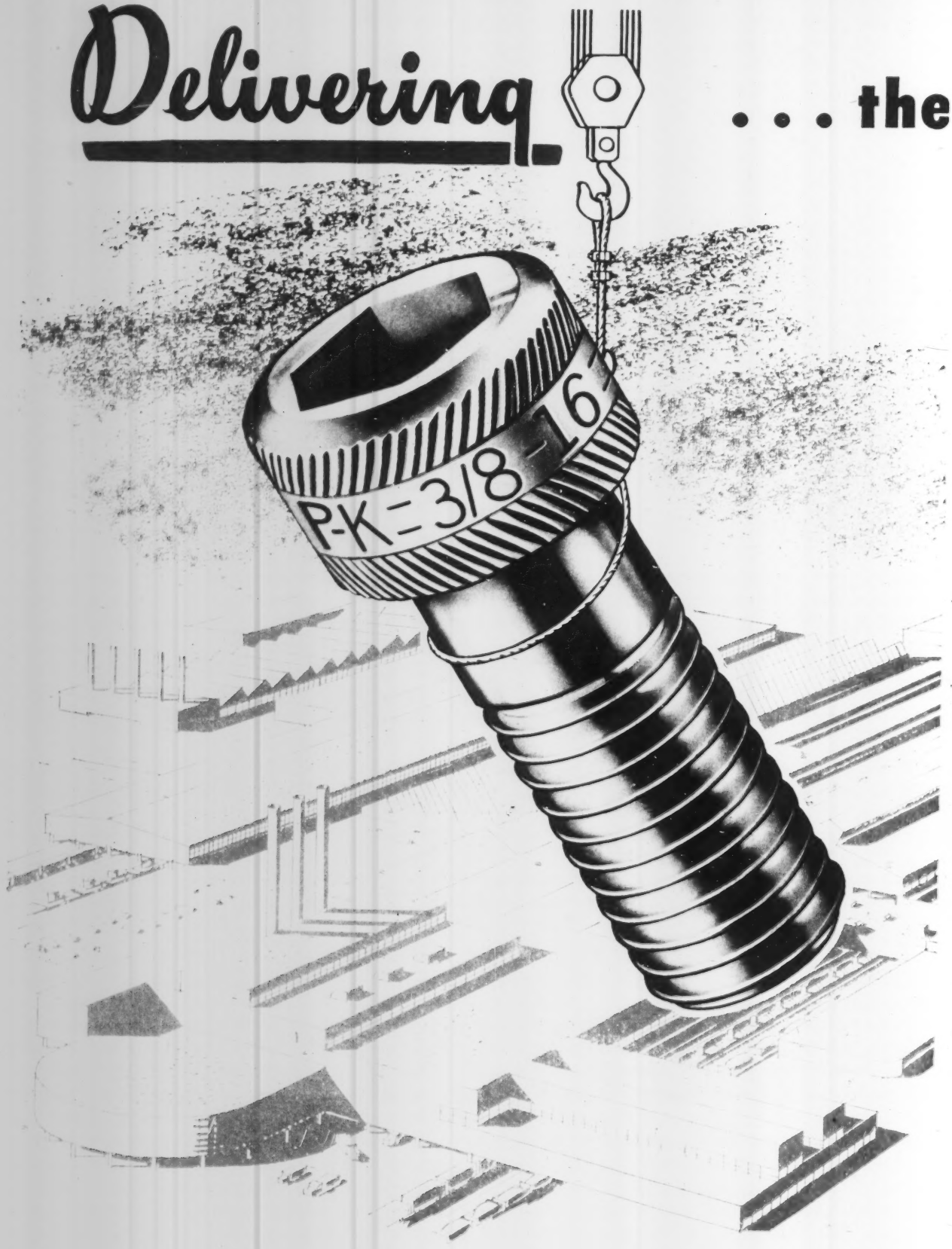
Stage	Material	Concentration	Temperature	Time
1. Clean	F-4 (alkali)	4–5 oz. gal	150-170° F	1 to 1½ min.
2. Rinse	Hot water	Overflow	160° F	½ to 1 min.
3. Phosphate	Fosbond 10	4 oz. gal	125-135° F	1 to 1½ min.
4. Rinse	Cold water	Overflow	Cold	½ to 1 min.
5. Chromic acid seal	Fosrinse CP	5 oz. 100 gal	140-150° F	½ to 1 min.

Note: Fosbond 10 is a nitrate-nitrite accelerated bath operated at 12-15 points concentration. Since it is not an iron free bath, it is necessary to oxidize ferrous iron with addition of sodium nitrite or Fosbond 10 A.

IMMERSION CYCLE INVOLVING RUST OR SCALE

Stage	Material	Concentration	Temperature	Time
1. Clean	Cleaner F-6	6–8 oz. gal	180-200° F	5 to 6 min.
2. Rinse	Hot water	Overflow		1 min.
3. Pickle	Fosbond 31	20-30% by volume	160-180° F	5 to 6 min.
4. Rinse	Cold water	Overflow		1 min.
5. Activate	Activip	½–1 oz. gal	Cold	1 min.
6. Phosphate	Fosbond 10	8 oz. gal	180-200° F	5 to 6 min.
7. Rinse	Cold water	Overflow		1 min.
8. Chromic seal	Fosrinse CP	5 oz. 100 gal	150-190° F	1 min.

Delivering . . . the



fastener ideas of the future

Back in 1942, the Size-Mark on Socket Cap Screws was considered a visionary idea, attainable only in the distant future, by most fastener authorities. Ground Threads on Socket Set Screws were thought another of such "dream" developments.

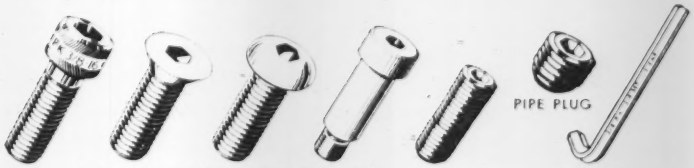
But Parker-Kalon licked the problems, *delivered* both improvements *within the year,* on P-K Socket Screws.

Originator of so many of the fasteners essential to modern assembly methods, Parker-Kalon has always preserved the pioneering spirit. You can continue to look to P-K for the fastener ideas of the future, *delivered today.*

Get samples of P-K Socket Screws . . . and compare. See why they'll put your product a step ahead . . . assembly-wise and sales-wise.

PARKER-KALON®
SOCKET SCREWS

The *only* Size-marked Socket Cap Screws
The *first* Ground Thread Socket Set Screws



SOCKET SCREW DIMENSION FINDER
Helps you plan assemblies. Pocket size plastic slide chart gives essential dimensions of all types of P-K Socket Screws. For a free Dimension Finder, Socket Screw samples, or other data, see your P-K Distributor. Or write: Parker-Kalon Corporation, 200 Varick Street, New York 14.

The INDUSTRIAL DISTRIBUTOR steers your supply dollars to the best values.

Single Coat Enameling

Titanium in enameling iron stabilizes carbon and does away with need for ground coat

ADDITION of titanium to enameling iron stabilizes carbon and provides a material for porcelain enameling that does away with necessity of ground coat and gives a finish equal to multi-coat ware in appearance.

Ti-namel, trade name of the product, was developed by Inland Steel Co. in co-operation with Titanium Alloy Mfg. Co.

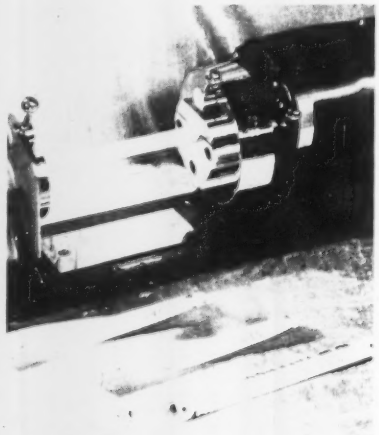
Properties include: Rockwell B hardness, from 45 to 60; tensile strength (normalized), about 50,000 psi; and yield strength at 0.2 per cent elongation, about 22,000 psi. It is said to be superior to enameling iron in resistance to sagging and deformation at high temperatures.

Workability—Material is non-aging, and even in the as-annealed condition, it does not show stretcher strain markings. Products fabricated by drawing do not show strain lines or welts in areas critically strained.

Fact that titanium ties up carbon in the steel (to prevent formation of gases by reaction with the enamel) makes material non-reboiling. Characteristic makes it possible for enamelers to apply the cover enamel coat directly to the base metal with minimum danger of pitting, blackspecking or blistering.

High resistance to enamel failure from thermal shock and normal heating is due to two properties: 1. High strength and resistance to creep at elevated temperatures and 2. A thin enamel coating finish.

Chipping—Two main causes of chipping are thickness of enamel coating and stresses at critical areas caused by lack of flatness of the enameled parts. Ti-namel, white-direct-to-steel process permits a thin enamel coating that is more resistant to chipping. Material's resistance to warping and sagging during enamel firing provides a finished product true to dimensions and shape.



Single coat takes 135 to 140 degree twist. Standard enameling iron with group coat plus white fails at 60

Single enamel coating will withstand more torsional stresses than multi-coated products. Strip will take twist of 135 to 140 degrees before enamel failure, while standard enameling iron, with ground coat with white, will fail after a twist of 60 degrees.

GLOBE

SUPERIOR LADLE BRICK

last longer

The greater heat resistance of GLOBE brick is well known in the steel industry. Because these bricks, wire cut or dry pressed, last longer—saving much time lost in refractory replacement—they help increase melting capacity. There is a type for every need, so let us place our experience at your disposal.

SERVING THE STEEL INDUSTRY SINCE 1873

The GLOBE BRICK Co.

EAST LIVERPOOL, OHIO

Small Fry... Big Business

Another example of how Carpenter ***Application Engineering Service*** *is helping industry cut costs, build sales.*

Mention cowboys and Indians to kids from 3 to 13 and their eyes light up, cap pistols start barking, and the fun is on. The game hasn't changed much or lost its excitement since we were small fry . . . but today it spells big business.

And making novelties like this decorative piece for belts and holsters in multi-million quantities, calls for a fine sense of production know-how and cost control. In this case, the Company wanted to hold down costs by cold forming the impressions in the dies, rather than machining them. This called for a special kind of die steel . . . one that would "take" the master form or hob but would still stand up in the presses under long, punishing runs.

Again, Carpenter was called in, and **A**pplication **E**ngineering **S**ervice went to work. Super Samson, a new steel developed in Carpenter laboratories for just such jobs, was recommended and used. Now the Company reports that Super Samson has saved considerable money in the *making* of the dies . . . and the Super Samson dies are turning out the novelties in big, profitable quantities.

Time and again, industry is finding new ways to save money and improve product sales with the help of Carpenter **A**pplication **E**ngineering **S**ervice . . . a service backed by almost 70 years of leadership in specialty steel development . . . a service that uses imagination to help your shopmen apply steels for best results. **A. E. S.** is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

Carpenter

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

Automatic Furnaces Added

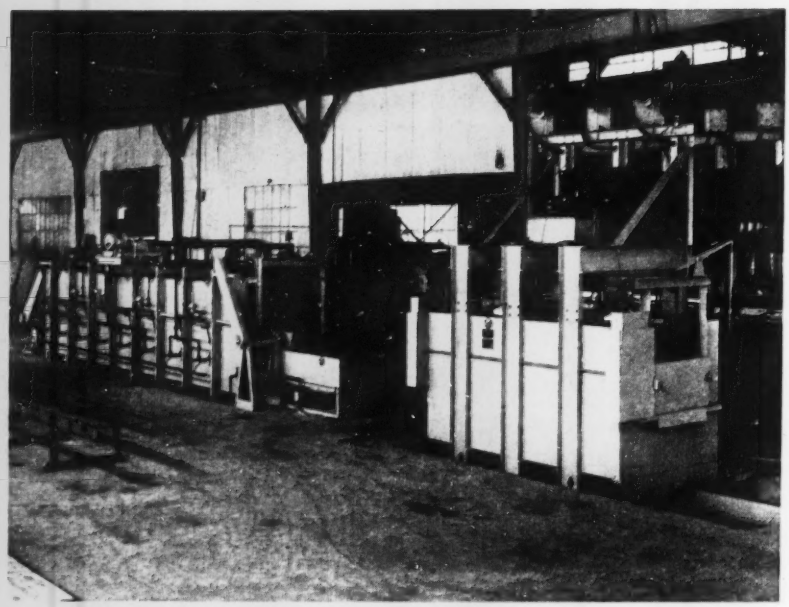
Line at Jessop's new ground steel division turns out 1300 pounds of blades per hour

AUTOMATIC furnace equipment capable of producing 1300 pounds per hour has been installed at Jessop Steel Co.'s new Tempered and Ground Steel Division plant at Washington, Pa.

Recently created division will produce steels heat treated, ground and tempered for such end products as band saws, resaws, steel for straight-edge, knife blades, doctor blades, scraper blades, valve compressor steel, textile machine parts, surgical instruments, shock absorbers and conveyor belts.

Facilities—Cut lengths of hot-rolled, band steel will be conveyed to a hardening furnace after passing through a set of pinch rolls. Hardening furnace length is 26 feet, 8 inches wide with an inside hearth maximum of 24 inches in width.

After conveying the cut band steel through the hardening furnace, it will pass through a set of leveling rolls. Steel bands are further conveyed in a continuous direction through a tempering furnace having an 8 foot travel. It is 10 feet long with three movable tempering platens. Subsequently, band steel is slid off to coil conveyors and carried to the edge grinders and further conveyed through pinch rolls and on to the brinell hardness check table. Final grinding and polishing equipment follows the hardness check. Machines for flat and edge grinding were designed for finishing and polishing long strips of steel and were designed by Jessop.



Hardening and automatic draw furnaces at new plant. After passing through the pinch rolls, hot-rolled band steel is conveyed to hardening furnace

Testers — Automatic hardness testers are designed to allow any spot on the band steel to be checked for hardness. There is also an electronic gaging device to check thickness tolerances automatically.

Equipment is housed in a new building, which is approximately 200 feet long x 48 feet wide.

HOW KRANE KAR SWING-BOOM CRANE SAVES M-H* DOLLARS

A MACHINERY MFR. reports, "KRANE KAR has cut our Materials-Handling costs on the average about 75%."

A FORGING PRODUCER writes, "Up to a quarter-million pounds of steel moved in an 8-hour day."

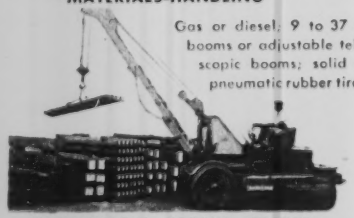
"KRANE KAR," a BALL BEARING MFR. says, "unloaded 50 tons of tubing from a box-car and transferred same to truck in 3 hours."

Another MANUFACTURER: "Simplified our materials-handling . . . saved us $3824.24 in 8 months."

ADDITIONAL CASE HISTORIES IN ILLUSTRATED BUL. #89

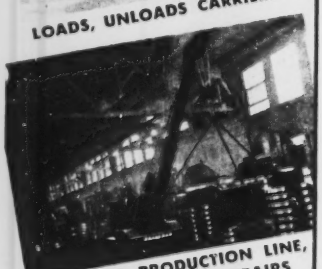
*MATERIALS-HANDLING

Gas or diesel; 9 to 37 ft. booms or adjustable telescopic booms; solid or pneumatic rubber tires.



TRANSPORTS, STACKS, STORES

LOADS, UNLOADS CARRIERS



WORKS ON PRODUCTION LINE, MAINTENANCE AND REPAIRS

MOVES SCRAP, WASTE MATERIAL

SILENT HOIST & CRANE CO. 849 63rd ST., BROOKLYN 20, N.Y.

GM Seeks Skilled Workers

General Motors, in an effort to speed resumption of Hydra-Matic output at Willow Run, has launched a nationwide drive to find 350 highly skilled workers. The Michigan Employment Security Commission and state employment service offices throughout the country are aiding in the search.

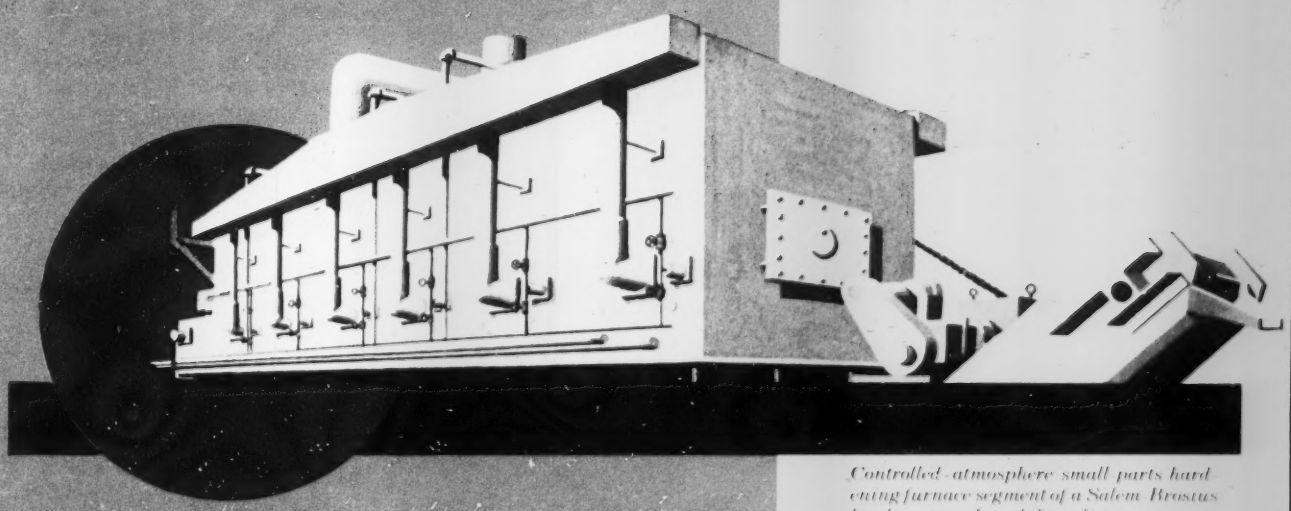
Salem-Brosius has a

bad habit

that means profit to you!

Salem-Brosius has the unfortunate habit of going to the extra trouble of engineering more quality into its furnaces than the application might indicate. Unfortunate for Salem-Brosius, but fortunate for you. Prices being equal, you, as a customer, can hardly lose from an extra measure of good design and sturdy construction that assures you greater production, longer life, and easier operation.

Take the case of the controlled-atmosphere small-parts hardening furnace shown here, for which Salem-Brosius is justifiably well-known. Users find that fast precise heating, complete atmosphere control, and rapid and high capacity materials handling mean better production. Why not take advantage of our bad habit of extra quality. Send us an inquiry for this or any other type of heat-treating furnace now.



Controlled-atmosphere small parts hardening furnace segment of a Salem-Brosius harden, quench and draw line.

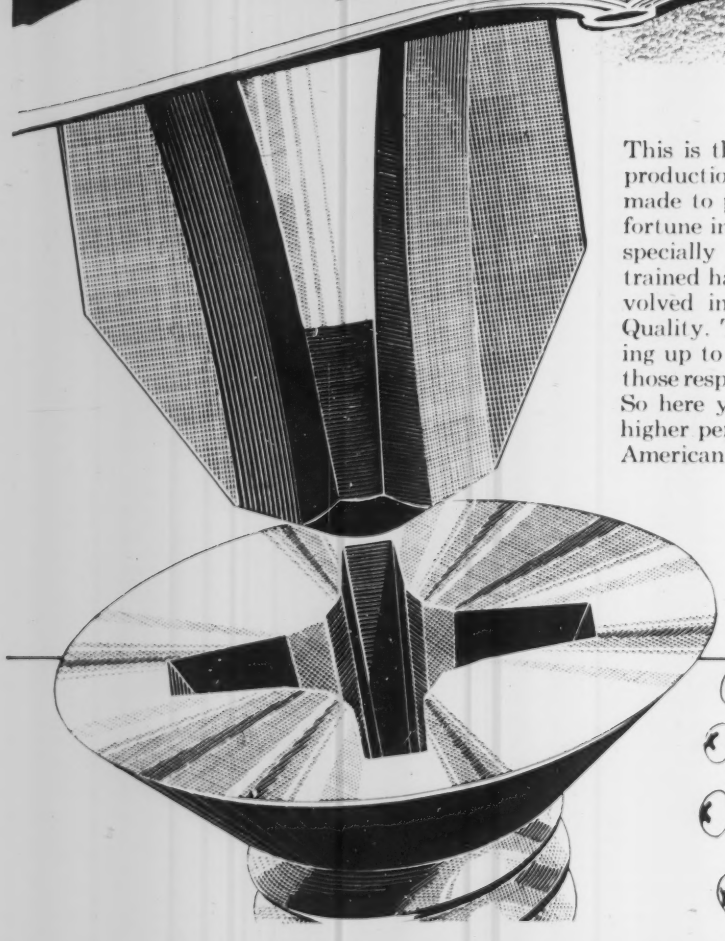
SALEM-BROSIUS, INC.

Sales and Executive Offices: 248 Fourth Avenue, Pittsburgh 22, Pa.

THE AMERICAN STORY

CHAPTER 14

Inspectors, too, have to "Stand Inspection"



This is the "*double*-checking department", where production gages and other inspection tools are made to pass muster at regular intervals. Here, a fortune in *master gages and tools* . . . many of them specially American-designed . . . are applied by trained hands to the intricate, integrated work involved in the jealous guardianship of American Quality. There are serious responsibilities in "living up to a name", and no organization ever took those responsibilities more seriously than American. So here you have another reason why you get a higher perfection-percentage in every shipment of American Phillips Screws. Write:

AMERICAN SCREW COMPANY

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.

STEEL
October 26, 1953

Market Outlook

STEEL production is riding high. After holding steady at a lofty 95 per cent of capacity rate all this month, it edged up to 95.5 per cent in the week ended Oct. 24. And there is no reason to expect the rate to be below 95 per cent in the final week of the month.

NOT BAD— While the current 95 per cent rate might at first glance appear low when compared with the 106.6 per cent average for October of last year, a rate of 95 per cent today yields almost as much steel as the 106.6 per cent rate of last October. The capacity on which this year's operating rates are computed is 8 per cent higher than that of last year. Output of steel for ingots and castings in October last year was 9,808,084 net tons. This year the October production should be approximately 9.5 million net tons.

SURPRISE— Such an output would be in sharp contrast to what some people expected. Earlier this year you could find people who thought steel output would be down to 90 per cent or less of capacity in the fourth quarter. One month of this quarter is nearly past and the rate this month hasn't been below 95 per cent.

ENCOURAGING— Not only is steel production moving along at a high rate but demand for steel at the mill level is firming up a little after easing during the summer. In numerous cases, the inventory reduction that steel consumers launched into has gone about as far as they can let it go.

The biggest consumer of steel—the automobile industry—is seeing its output reviving after a summer lull. Its production now exceeds that of a year ago. A producer of household refrigerators reports its sales are running 82 per cent ahead of last year.

BUSINESS SHIFT— Good business is not being experienced by all steel producers, however. Producers who have been charging premium prices for steel find customers are drifting away to producers who have been quoting standard prices. In one instance, a premium price mill, which earlier this year was running at 100 per cent of capacity, is down to 20 per cent. This movement of customers is keeping the order books of standard price mills well enough filled to sustain the average operating rate for the industry at 95 per cent of capacity.

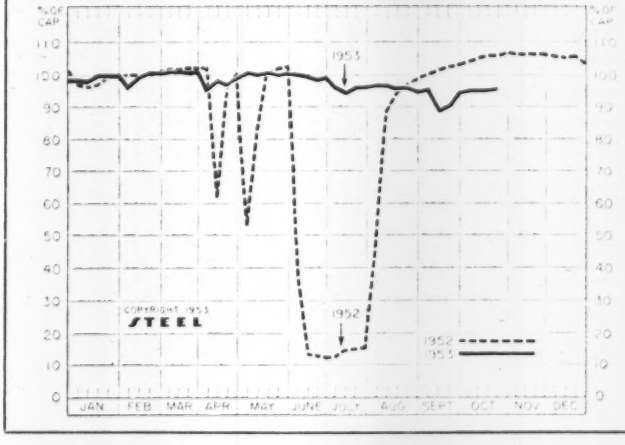
PRICE INDEX DECLINES— To try to retain business, premium price mills continue to reduce or eliminate the premiums. As a result, STEEL's arithmetical price composite on finished steel declined to $115.41 a ton, down 13 cents.

The increased competition for steel business is not limited, however, to premium price mills. Others are absorbing freight charges to get business they want.

TIDE HAS TURNED— Prices of scrap, one of the principal raw materials used by steelmakers, continue to edge upward. Many analysts thought scrap prices had overcorrected themselves downward in response to the decline in steel demand. When steel demand firmed up, scrap prices did a quick about-face. In the week ended Oct. 22, the third consecutive week of rise, STEEL's price composite on steelmaking grades of scrap rose 33 cents to $32.83 a ton.

Another buoyant to scrap prices may be the government's relaxation of export controls on all grades of iron and steel scrap.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Oct. 24	Change	Same Week 1952	Same Week 1951
Pittsburgh	95.5	2.5*	106.5	102
Chicago	98.5	0*	110.5	106.5
Mid-Atlantic	97	0	99	99
Youngstown	101	1	105	106
Wheeling	98	3.5	96	102
Cleveland	100	0.5*	112.5	101.5
Buffalo	106.5	0	95	104
Birmingham	96.5	0	106	104
New England	85	4	91	90
Cincinnati	80.5	0	90	103
St. Louis	95.5	5	110	104
Detroit	100.5	0	106	101
Western	100	2	103	104.5
Estimated National Rate	95.5	+ 0.5	105.5	103

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,450 net tons in 1953; 2,077,040 tons in 1952; 1,966,034 tons in 1951.

The Metalworking Outlook—p. 63 The Technical Outlook—p. 113

PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Oct. 20

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.400	Bars, H.R., alloy	$5.675	Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H. R., stainless, 303 (lb)	0.418	Strip, H.R., carbon	5.013	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	5.125	Bars, H.R., carbon	4.850	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, reinforcing	4.775	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, C.F., carbon	7.860	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., alloy	11.075	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.383	Bars, C.F., stainless, 302 (lb)	0.433	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Sheets, H.R., carbon	4.765	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.505	Sheets, C.R., carbon	5.904	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, galvanized	6.945	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R. alloy, high speed W 18, Cr 4, V 1 (lb)	1.730	Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.183				
		Strip, C.R., carbon	7.286				

‡Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Oct. 20 1953	Oct. 13 1953	Month Ago	Sept. Average
(1947-1949=100)	141.5	141.5	141.7	141.7

STEEL's FINISHED STEEL PRICE INDEX

	Oct. 22 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.38	189.38	189.38	181.31	151.86
Index in cents per lb.	5.130	5.130	5.130	4.912	4.114

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Oct. 22 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$115.41	$115.54	$115.56	$110.98	$95.05
No. 2 Fdry. Pig Iron, GT.	56.54	56.54	56.54	55.04	46.50
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.29
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	47.20
Steelmaking Scrap, GT.	32.83	32.50	36.50	43.00	43.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Oct. 22 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, deld., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	3.975-4.425	3.975-4.425	3.975-4.425	3.75-4.225	3.50
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45-5.95	5.45-5.95	5.45-5.95	5.10-5.80	4.00
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.475-5.525	5.475-5.525	5.475-5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.35-6.55	6.35-6.55	6.35-6.55	6.20-6.35	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅝", Pitts.	4.525	4.525	4.525	4.325	3.775

PIG IRON, Gross Ton

	Oct. 22 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, deld. Phila.	60.75	60.75	60.75	59.25	50.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	44.75
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, deld. Phila.	61.25	61.25	61.25	59.75	50.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	45.00
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$36.50	$36.50	$39.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	31.50	31.50	34.50	41.50	45.25
No. 1 Heavy Melt, Chicago	30.50	29.50	35.50	42.50	41.75
No. 1 Heavy Melt, Valley	34.50	34.50	36.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	31.50	31.50	32.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	34.50	33.50	37.25	43.00	48.50
Rails, Rerolling, Chicago	42.50	42.50	51.00	52.50	66.50
No. 1 Cast, Chicago	32.50	32.50	35.00	48.50	70.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99% plus, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 24.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5% 34.50, Lone Star brand, 35.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb deld.

Cobalt: 97-99%, $2.40 per lb for 550 lb keg; $2.42 per lb for 100 lb case; $2.47 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 deld. Conn. Valley 29.625-30.125 deld. Midwest; Lake 30.125 deld; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.40, corroding 13.40, St. Louis. New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

DAILY NONFERROUS PRICE RECORD

	Price Oct. 22	Last Change	Previous Price	Sept. Avg.	Aug. Avg.	Oct. 1952 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.500	29.375	24.500
Lead	13.30	Sept. 16	13.80	13.540	13.800	14.226
Zinc	10.00	Sept. 11	10.50	10.180	11.000	13.259
Tin	79.50	Oct. 21	79.75	82.410	80.530	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99% plus, deld.; Magnesium, 99.8%, Freeport, Tex.

Mercury: Open market, spot, New York, $184-$186 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "5-X" nickel shot 63.65; "F" nickel shot or ingots, for addition to cast iron 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz. nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz. from refineries.

Radium: $16.00-$21.50 per mg. radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $4.25-$4.75 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $12.45 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 79.50.

Titanium: Sponge, 99.3 plus %, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $6.30. Treated ingots $10.43.

Zinc: Price western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 20.25-21.25; No. 12 foundry alloy (No. 2 grade) 19.50-20.50; 5% silicon alloy, 0.60 Cu max., 22.25-23.00; 13 alloy, 0.60 Cu max., 22.25-23.00; 195 alloy 21.00-22.00; 108 alloy 20.00-21.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.50-21.00; grade 2, 19.00-20.00; grade 3, 18.00-19.00; grade 4, 17.00-18.00.

Brass Ingot: Red brass, No. 115 24.50; tin bronze, No. 225, 35.25; No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.50-22.25.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	...	60.0	...

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range Inches	Widths or Diameters, Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., widths or diameters 24-60 in., lengths 72-240 in.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
18-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* Widths or diameters 24-48 in., lengths 72-180 in.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	59.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	44.8	42.1	47.3	45.7
Rolled				
1.063	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in., rectangles and squares, Class 1, 49.2 to 37.6 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Industrial Roofing Sheet (0.032-in. thick): Flat, 42.75 in. wide, lengths 60-144 in., $2.838 to $6.816 per sheet. Corrugated, 35 in. wide, lengths 60-144 in., $2.862 to $6.874 per sheet.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 105.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a Sheet, Strip, Plate	Rod	Wire	Seamless Tube	SCRAP ALLOWANCES f Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	40.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 12.00; low copper clippings 9.00; mixed clippings 9.00; old sheet 8.00-8.50; borings and turnings 5.00-5.50; pistons and struts 8.00; crankcases 8.00; industrial castings 8.00-8.50.

Copper and Brass: Heavy copper and wire, No. 1 24.00, No. 2 copper 23.00; light copper 17.50-18.50; No. 1 composition red brass 16.00-16.50; No. 1 composition turnings 15.50-16.00; mixed brass turnings 9.50; new brass clippings 17.50; No. 1 brass rod turnings 12.00; light brass 12.50; heavy yellow brass 12.00; new brass rod ends 14.00-14.50; auto radiators, unsweated 12.00; cocks and faucets 13.50; brass pipe 15.00.

Lead: Heavy 9.50-10.00; battery plate 5.25-5.75; linotype and stereotype 11.75; electrotype 10.50; mixed babbitt 12.00.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 26.00-28.00; old sheet 24.00-26.00; turnings 19.00-21.00; rods 26.00-28.00.

Nickel: Sheets and clips 70.00; rolled anodes 70.00; turnings 40.00; rod ends 70.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clipping 13.50-14.00; 51S, 52S clippings 13.50-14.00; 14S, 17S, 24S clippings 12.50-13.00; mixed clippings 12.00-13.00; old sheet 9.50-10.50; old cast 9.50-10.50; clean old cable, free of steel 13.50-14.00; borings and turnings 10.00-11.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 24.00; No. 2 copper 22.25; light copper 20.75; refinery brass 20.00; coppers per dry copper content 19.00; auto radiators 13.00 nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 24.00-24.50; No. 2 copper 22.50-23.00; light copper 21.00-21.50; No. 1 composition borings 16.50-17.00; No. 1 composition solids 17.00-17.50; heavy yellow brass solids 13.00-13.50; yellow brass turnings 12.50-12.75; radiators 13.00-13.50.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.1 per lb.

Copper: Flat-rolled 45.04; oval 44.54; 2000-5000 lb; electrodeposited 39.78, cast 42.04; 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-1999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb 98.5; 200-499 lb 97; 500-999 lb 96.5; 1000 lb or more 96.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,900 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.500; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.50, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 64.8; 100-699 lb 51; 700-1999 lb 48.5; 2000-9999 lb 46.7; 10,000 lb or more 45.6.

Stannous Chloride (Anhydrous): Less than 50 lb $1.40; 50 lb $1.15; 100-399 lb $1; 400-999 lb 97.6; 1000-1999 lb 95.2; 2000-4999 lb 91.5; 5000-19,000 lb 85.4; 20,000 lb and over 79.3 over 85.10.

Stannous Sulphate: Less than 50 lb $1.194; 50 lb 85.1; 100-1999 lb 87.1; 2000 lb and over 85.1.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Buying of nonferrous metals picks up. While there are numerous reasons for the upturn, the principal one is the revival of business optimism

BUYERS' STRIKE in nonferrous metals appears to be ending.

While many of the factors bringing this about are of a transient nature, they've still had sufficient cumulative effect to smoke out more orders and firm prices. Purchasing agents aren't nearly as leery about placing business as they were a month ago.

Less Pessimism Buyers' change of heart is brought about by such diversified things as depletion of fabricating stocks, sharp drop in available imports because of improved demand abroad, international jitters, mine strikes and smelter shutdowns.

Helping more than anything else, perhaps, is a revival of business optimism after the flood of dire warnings about varying degrees of economic catastrophe about to befall us. Industry men now believe that even though competition is returning they will still eat high off the hog next year.

Waiting in Vain Users of copper have about given up waiting for the big price crash expected since early summer. They couldn't foresee the Chilean shenanigans or the current diplomatic negotiations for purchase of some or all of the near-150,000 tons of unsold Chilean copper.

Copper changed price last week, the first move it has made since Aug. 19. A custom smelter advanced its selling price to 29.50 a pound, delivered Valley, and other sellers followed, setting a price range of 29.50-30.00. Domestic mine producers still maintain a 36-cent level.

The Outlook Until a decision comes in Chile, there's little likelihood of a drop in copper price. Strikes in Canada and Chile are still in effect, though U. S. labor troubles have been settled. Copper users fear a pinch in supplies during the winter and are putting in November orders early and in greater volume.

Pickup in European demand sent prices in London to highest peaks since free trading began in August. Scrap copper is also in good demand, chiefly because exporters representing Japanese, German and Italian smelters have been outbidding U. S. firms by up to 2 cents a pound in our own markets to get it.

Welcome Respite Even lead and zinc are getting a little relief from their numerous woes, though supplies are extra-plentiful. Zinc markets abroad have taken on a healthier glow in the last few weeks. The price level abroad makes it unprofitable to ship the metal here, and imports are expected to dry up considerably in coming weeks. U. S. users are about at the bottom of their barrel and should be taking more zinc soon.

Lead, too, has benefited from stronger European demand. Most Mexican lead is now being shipped there. U. S. refined lead production in September, 42,154 tons, topped August by 4134 tons. In the first nine months, production was 387,893 tons, about 5000 tons higher than in the same period last year. September shipments amounted to 41,598 tons, up slightly from August; nine-month shipments at 365,209 tons were up about 7000 tons from last year's comparable period.

Products Make Debut

New low-content beryllium-copper alloy combining high strength and hardness with toughness and good electrical conductivity was introduced at the Metal Show in Cleveland last week by the Beryllium Corp., Reading, Pa. Containing only one per cent beryllium, the alloy — Beryldur — is viewed as a potential rival of bronzes and brasses. Properties may be varied by simple heat treatment and alloy can be worked and shaped moderately after mill-hardening. It is available in heat treatable temper for use where severe forming is needed or where peak physical properties are essential and in mill-hardened temper where finished parts require no heat treatment.

A ferroberyllium master alloy, containing 5 per cent beryllium in iron, is another product announced. Chief use is for hardening stainless steel castings or wrought products.

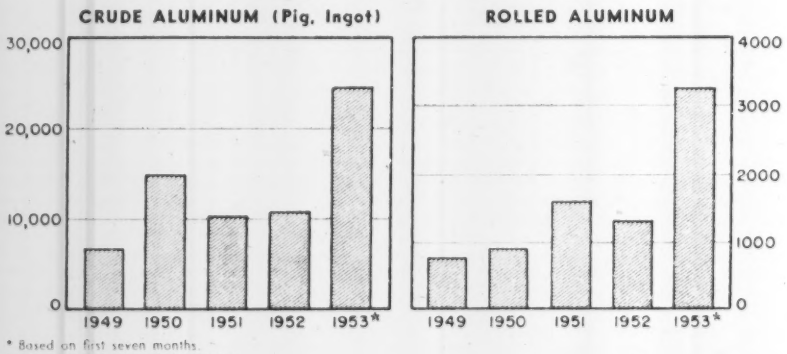
In a trial balloon to test market possibilities, Beryllium Corp. also showed three new alloys containing no beryllium at all. They are zirconium magnesium, manganese aluminum and titanium manganese aluminum. First one is an oxygen-free hardening material designed for use in producing magnesium alloy castings and containing 30-40 per cent zirconium. Manganese aluminum, a 50-50 alloy, can be used as a manganese additive to titanium alloys and possibly in aluminum alloys. Third product contains 30 per cent manganese, 30 per cent aluminum and the balance titanium. "Proportions are designed to bring out useful and possibly new properties," says the company.

Magnesium Output Drops

Shutdown of government magnesium plants in June is clearly evidenced by August primary production figures. Ingot output in August was 36 per cent below the year before. The 6265 tons turned out about equaled July.

U. S. IMPORTS OF ALUMINUM

Monthly Averages—Net Tons



* Based on first seven months.
Source: U. S. Bureau of the Census.

every grade of ZINC

for urgent military and

civilian requirements

SLAB ZINC

PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

Distributors for

AMERICAN ZINC, LEAD & SMELTING COMPANY

Columbus, O. Chicago St. Louis New York

STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company, key on page 173. Key to footnotes, page 173.

—SEMIFINISHED—

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 $86.00
Munhall,Pa. U5 59.00

INGOTS, Alloy (NT)
Detroit R7 $83.00
Fontana,Calif. K1 88.00
Midland,Pa. C18 62.00
Munhall,Pa. U5 62.00

BILLETS, BLOOMS & SLABS
Carbon Rerolling (NT)
Aliquippa,Pa. J5 $62.50
Bessemer,Pa. U5 62.00
Clairton,Pa. U5 62.00
Ensley,Ala. T2 62.00
Fairfield,Ala. T2 62.00
Fontana,Calif. K1 81.00
Gary,Ind. U5 62.00
Johnstown,Pa. B2 62.00
Lackawanna,N.Y. B2 62.00
Munhall,Pa. U5 62.00
So. Chicago,Ill. U5 62.00
So. Duquesne,Pa. U5 62.00

Carbon, Forging (NT)
Aliquippa,Pa. J5 $75.50
Bessemer,Pa. U5 75.50
Buffalo R2 75.50
Canton,O. R2 75.50
Clairton,Pa. U5 75.50
Cleveland R2 75.50
Conshohocken,Pa. A3 82.50
Detroit R7 78.50
Ensley,Ala. T2 75.50
Fairfield, Ala. T2 75.50
Fontana,Calif. K1 94.50
Gary,Ind. U5 75.50
Geneva,Utah C11 75.50
Houston S5 85.50
Johnstown,Pa. B2 75.50
Lackawanna,N.Y. B2 75.50
Los Angeles B3 94.50
Munhall,Pa. U5 75.50
Seattle B3 94.50
So.Chicago R2,U5,W14 75.50
So.Duquesne,Pa. U5 75.50
So.SanFrancisco B3 94.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 $82.00
Buffalo R2 82.00
Canton,O. R2 82.00
Canton,O. I7 *82.00*
Conshohocken,Pa. A3 89.00
Detroit R7 84.00
Fontana,Calif. K1 101.00
Gary,Ind. U5 82.00
Houston S5 92.00
Ind.Harbor,Ind. Y1 82.00
Johnstown,Pa. B2 82.00
Lackawanna,N.Y. B2 82.00
Los Angeles B3 102.00
Massillon,O. R2 82.00
Midland,Pa. C18 82.00
Munhall,Pa. U5 82.00
So.Chicago R2,U5,W14 82.00
So.Duquesne,Pa. U5 82.00
Struthers,O. Y1 82.00
Warren,O. C17 82.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 $92.50
Canton,O. R2 92.50
Cleveland R2 92.50
Fontana,Calif. K1 113.50
Gary,Ind. U5 92.50
Massillon,O. R2 92.50
So.Chicago,Ill. R2 92.50
So.Duquesne,Pa. U5 92.50

SHEET BAR (NT)
Fontana,Calif. K1 $93.18

SKELP
Aliquippa,Pa. J5 3.85
Munhall,Pa. U5 3.75
Warren,O. R2 3.75
Youngstown R2, U5 3.75

WIRE RODS
AlabamaCity,Ala. R2 4.525
Aliquippa,Pa. J5 4.525
Alton,Ill. L1 4.70
Buffalo W12 4.525
Cleveland A7 4.525
Donora,Pa. A7 4.525
Fairfield,Ala. T2 4.525
Fontana,Calif. K1 5.325
Houston S5 4.925
Johnstown,Pa. B2 4.525
Joliet,Ill. A7 4.525
KansasCity,Mo. S5 4.85
LosAngeles B3 5.325
Minnequa,Colo. C10 4.775
Monessen,Pa. P7 4.725
No.Tonawanda,N.Y. B11 4.525
Pittsburg,Calif. C11 5.175
Portsmouth P12 4.525
Roebling,N.J. R5 4.625
So.Chicago,Ill. R2 4.525
Sparrows Point,Md. B2 4.625
Sterling,Ill. (1) N15 4.525
Struthers,O. Y1 4.525
Torrance,Calif. C11 5.325
Worcester,Mass. A7 4.825

—STRUCTURALS—

Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 4.10
Aliquippa,Pa. J5 4.10
Bessemer,Ala. T2 4.10
Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fairfield,Ala. T2 4.10
Fontana,Calif. K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah C11 4.10
Houston S5 4.60
Ind.Harbor,Ind. I-2 4.10
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.80
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.80
Minnequa,Colo. C10 4.55
Munhall,Pa. U5 4.10
Niles,Calif.(22) P1 4.91
Phoenixville,Pa. P4 4.95
Seattle B3 4.85
So.Chicago,Ill. U5, W14 4.10
So.SanFrancisco B3 4.75
Torrance,Calif. C11 4.80
Welrton,W.Va. W6 4.35

Wide Flange
Bethlehem,Pa. B2 4.15
Clairton,Pa. U5 4.10
Fontana,Calif. K1 5.20
Lackawanna,N.Y. B2 4.15
Munhall,Pa. U5 4.10
So.Chicago,Ill. U5 4.10

Alloy Stand. Shapes
Clairton,Pa. U5 5.00
Fontana,Calif. K1 6.40
Gary,Ind. U5 5.00
Munhall,Pa. U5 5.00
So.Chicago,Ill. U5 5.00

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 6.175
Bessemer,Ala. T2 6.175
Bethlehem,Pa. B2 6.20
Clairton,Pa. U5 6.175
Fairfield,Ala. T2 6.175
Fontana,Calif. K1 6.825
Gary,Ind. U5 6.175
Geneva,Utah C11 6.175
Ind.Harbor,Ind. I-2 6.175
Ind.Harbor,Ind. Y1 6.675
Johnstown,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
LosAngeles B3 6.85
Munhall,Pa. U5 6.175
Seattle B3 6.90
So.Chicago,Ill. U5, W14 6.175
So.SanFrancisco B3 6.80
Struthers,O. Y1 6.675

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 6.20
Lackawanna,N.Y. B2 6.20
Munhall,Pa. U5 6.125
So.Chicago,Ill. U5 6.125

BEARING PILES
Munhall,Pa. U5 4.10
So.Chicago,Ill. U5 4.10

—PILING—

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 4.925
Lackawanna,N.Y. B2 4.925
Munhall,Pa. U5 4.925
So.Chicago,Ill. U5 4.925

—PLATES—

PLATES, Carbon Steel
AlabamaCity,Ala. R2 4.10
Aliquippa,Pa. J5 4.10
Ashland,Ky. (15) A10 4.10
Bessemer,Ala. T2 4.10
Clairton,Pa. U5 4.10
Claymont,Del. C22 4.55
Cleveland J5 R2 4.10
Coatesville,Pa. L7 4.35
Conshohocken,Pa. A3 4.55
Ecorse,Mich. G5 *4.60*
Fairfield,Ala. T2 4.10
Fontana,Calif.(30) K1 4.75
Gary,Ind. U5 4.10
Geneva,Utah C11 4.10
Granite City,Ill. G4 4.30
Harrisburg,Pa. C6 4.95
Houston S5 4.60
Ind.Harbor,Ind. I-2, Y1 4.10
Johnstown,Pa. B2 4.10
Lackawanna,N.Y. B2 4.10
Minnequa,Colo. C10 4.55
Munhall,Pa. U5 4.10
Pittsburgh J5 4.10
Riverdale,Ill. A1 4.10
Seattle B3 5.00
Sharon,Pa. S2 4.10
So.Chicago,Ill. U5, W14 4.10
SparrowsPoint,Md. B2 4.10
Steubenville,O. W10 4.10
Warren,O. R2 4.10
Weirton,W.Va. W6 4.40
Youngstown R2, U5, Y1 4.10

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 5.90
Geneva,Utah C11 5.25

PLATES, Wrought Iron
Economy,Pa. B14 5.30

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 6.25
Bessemer,Ala. T2 6.25
Clairton,Pa. U5 6.25
Cleveland J5 6.25
Conshohocken,Pa. A3 6.25
Ecorse,Mich. G5 *6.45*
Fairfield,Ala. T2 6.25
Fontana,Calif.(30) K1 6.95
Gary,Ind. U5 6.25
Geneva,Utah C11 6.25
Ind.Harbor,Ind. I-2 6.25
Ind.Harbor,Ind. Y1 6.75
Johnstown,Pa. B2 6.25
Lackawanna,N.Y. B2 6.25
Munhall,Pa. U5 6.25
Pittsburgh J5 6.25
Seattle B3 7.15
Sharon,Pa. S3 6.25
So.Chicago,Ill. U5, W14 6.25
SparrowsPoint,Md. B2 6.25
Youngstown U5 6.25
Youngstown Y1 6.75

PLATES, Alloy
Claymont,Del. C22 5.65
Coatesville,Pa. L7 5.75
Fontana,Calif. K1 6.60
Gary,Ind. U5 5.55
Johnstown,Pa. B2 5.55
Munhall,Pa. U5 5.55
Sharon,Pa. S3 5.55
So.Chicago,Ill. U5 W14 5.55
SparrowsPoint,Md. B2 5.55

FLOOR PLATES
Cleveland J5 5.15
Conshohocken,Pa. A3 5.15
Ind.Harbor,Ind. I-2 5.15
Munhall,Pa. U5 5.15
So.Chicago,Ill. U5 5.15

PLATES, Ingot Iron
Ashland,c.l. (15) A10 4.35
Ashland,l.c.l (15) A10 4.85
Cleveland, c.l. R2 4.70
Warren,O. c.l. R2 4.70

—BARS—

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 4.15
Aliquippa,Pa. J5 4.15
Alton,Ill. L1 4.35
Atlanta,Ga. A11 4.40
Bessemer,Ala. T2 4.15
Buffalo R2 4.15
Canton,O. R2 4.15
Clairton,Pa. U5 4.15
Cleveland R2 4.15
Detroit R7 4.30
Ecorse,Mich. G5 *4.45*
Emeryville,Calif. J7 4.90
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 *4.80*
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Houston S5 4.65
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity, Mo. S5 4.85
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.85
Milton,Pa. B6 4.15
Minnequa,Colo. C10 4.60
Niles,Calif. P1 4.85
N.Tonawanda,N.Y. B11 4.15
Pittsburg,Calif. C11 4.85
Pittsburgh J5 4.15
Portland,Oreg. O4 4.90
Seattle B3, N14 4.90
So.Chicago R2, U5, W14 4.15
So.Duquesne,Pa. U5 4.15
So.SanFran.,Calif. B3 4.90
Sterling,Ill.(1) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Weirton,W.Va. W6 4.30
Youngstown R2, U5 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 4.875
Buffalo R2 4.875
Canton,O. I7 *7.875*
Canton,O. R2 4.875
Clairton,Pa. U5 4.875
Detroit R7 4.975
Ecorse,Mich. G5 *5.05*
Fontana,Calif. K1 5.925
Gary,Ind. U5 4.875
Houston S5 5.375
Ind.Harbor,Ind. I-2, Y1 4.875
Johnstown,Pa. B2 4.875
KansasCity, Mo. S5 5.575
Lackawanna,N.Y. B2 4.875
LosAngeles B3 5.925
Massillon,O. R2 4.875
Midland,Pa. C18 4.875
So.Chicago R2, U5,W14 4.875
So.Duquesne,Pa. U5 4.875
Struthers,O. Y1 4.875
Warren,O. C17 4.875
Youngstown U5 4.875

BARS & SMALL SHAPES, H.R
High-Strength Low-Alloy
Aliquippa,Pa. J5 6.225
Bessemer,Ala. T2 6.225
Bethlehem,Pa. B2 6.225
Clairton, Pa. U5 6.225
Ecorse,Mich. G5 *6.425*
Fairfield,Ala. T2 6.225
Fontana,Calif. K1 7.475
Gary,Ind. U5 6.225
Ind.Harb.,Ind. Y1 6.725
Ind.Harb.,Ind. I-2 6.225
Johnstown,Pa. B2 6.225
Lackawanna,N.Y. B2 6.225
LosAngeles B3 6.925
Pittsburgh J5 6.225
Seattle B3 6.975
So.Chicago W14 6.225
So.Duquesne,Pa. U5 6.225
So.SanFrancisco B3 6.975
Struthers,O. Y1 6.725
Youngstown U5 6.225

BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 4.35

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 4.15
Atlanta A11 4.40
Niles,Calif. P1 4.85
SanFrancisco S7 5.10

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 5.00
Fontana,Calif. K1 6.00
Gary,Ind. U5 5.00
Houston S5 5.70
KansasCity S5 5.90
Youngstown U5 5.00

BARS, Cold-Finished Corbon
Ambridge,Pa. W18 5.20
BeaverFalls,Pa. M12, R2 5.20
Buffalo B5 5.25
Camden,N.J. P13 5.65
Carnegie,Pa. C12 5.20
Chicago W18 5.20
Cleveland A7, C20 5.20
Detroit P17, R7 5.35
Detroit B5 5.40
Donora,Pa. A7 5.20
Elyria,O. W8 5.20
FranklinPark,Ill. N5 5.20
Gary,Ind. R2 5.20
GreenBay,Wis. F7 5.185
Hammond,Ind. L2, M13 5.20
Hartford,Conn. R2 5.75
Harvey,Ill. B5 5.20
LosAngeles R2 6.65
Mansfield,Mass. B5 5.75
Massillon,O. R2, R8 5.20
Monaca,Pa. S17 5.20
Newark,N.J. W18 5.65
NewCastle,Pa. (17) B4 5.20
Pittsburgh J5 5.20
Plymouth,Mich. P5 5.45
Putnam,Conn. W18 5.75
Readville,Mass. C14 5.75
St.Louis,Mo. M5 5.50
So.Chicago,Ill. W14 5.20
SpringCity,Pa. S3 5.65
Struthers,O. Y1 5.20
Waukegan,Ill. A7 5.20
Worcester,Mass. W19 6.10
Youngstown F3, Y1 5.20

BARS, Cold-Finished Corbon
(Turned and Ground)
Cumberland,Md.; (5) C19 4.45

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 6.325
BeaverFalls,Pa. M12 6.325
Bethlehem,Pa. B2 6.325
Buffalo B5 6.325
Camden,N.J. P13 6.50
Canton,O. R2 6.325
Canton,O. I7 *6.325*
Carnegie,Pa. C12 6.00
Chicago W18 6.325
Cleveland A7, C20 6.325
Detroit P7 6.425
Detroit P17 6.475
Detroit B5 6.525
Donora,Pa. A7 6.325
Elyria,O. W8 6.325
Gary,Ind. R2 6.325
Hammond,Ind. L2, M13 6.325
Hartford,Conn. R2 6.775
Harvey,Ill. B5 6.325
Lackawanna,N.Y. B2 6.325
Mansfield,Mass. B5 6.775
Massillon,O. R2 R8 6.325
Midland,Pa. C18 6.325
Monaca,Pa. S17 6.325
Newark,N.J. W18 6.65
Plymouth,Mich. P5 6.525
So.Chicago,Ill. R2, W14 6.325
SpringCity,Pa. K3 6.475
Struthers,O. Y1 6.325
Warren,O. C17 6.325
Waukegan,Ill. A7 6.325
Worcester,Mass. A7 6.625
Youngstown F3, Y1 6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 4.15
Atlanta A11 4.40
Buffalo R2 4.15
Cleveland R2 4.15
Emeryville,Calif. J7 4.90
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 *4.80*
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Houston S5 4.65
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.85
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.85
Milton,Pa. B6 4.15
Minnequa,Colo. C10 4.75
Niles,Calif. P1 4.85
Pittsburg,Calif. C11 4.85
Pittsburgh J5 4.15
SandSprings,Okla. S5 5.05
Seattle B3, N14 4.90
So.Chicago,Ill. R2 4.15
So.Duquesne,Pa. U5 4.15
So. SanFrancisco B3 4.90
SparrowsPoint,Md. B2 4.15
Sterling,Ill. (1) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Youngstown R2, U5 4.15

BARS, Reinforcing
(Fabricated; to consumers)
Johnstown, ¼-1" B2 5.55
KansasCity S5 6.35
LosAngeles B3 6.18
Marion,O. P11 5.55
Seattle N14 5.80
Seattle B3 6.25
So.SanFrancisco B3 6.25
SparrowsPt. ½-1" B2 5.55
Williamsport,Pa. S19 5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 4.75
ChicagoHts.(3) C2 4.50
ChicagoHts.(4) C2 4.75
ChicagoHts.(3,4) I-2 4.50
FortWorth,Tex.(26) T4 4.65
Franklin,Pa.(3) F5 4.50
Franklin,Pa.(4) F5 4.75
Marion,O.(3) P11 4.50
Moline,Ill.(3) R2 4.50
Tonawanda(3,4) B12 5.00
Williamsport,Pa.(3) S19 5.25
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(Staybolt) L5 15.50
McK.Rks.(S.R.) L5 10.40
McK.Rks.(D.R.) L5 14.00

—SHEETS—

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 3.925
Allenport,Pa. P7 3.925
Ashland,Ky.(8) A10 3.925
Butler,Pa. A10 3.925
Cleveland J5, R2 3.925
Conshohocken,Pa. A3 4.05
Detroit M1 4.40
Ecorse,Mich. G5 4.125
Fairfield,Ala. T2 3.925
Fairless,Pa. U5 4.025
Fontana,Calif. K1 4.70
Gary,Ind. U5 3.925
Geneva,Utah C11 4.025
GraniteCity,Ill. G4 4.125
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 3.925
Kokomo,Ind. C16 *4.025*
Lackawanna,N.Y. B2 3.925
Chicago W18 6.325
Cleveland A7, C20 6.325
Detroit P7 6.425
Detroit P17 6.475
Detroit B5 6.525
Donora,Pa. A7 6.325
Elyria,O. W8 6.325
Gary,Ind. R2 6.325
Hammond,Ind. L2, M13 6.325
Hartford,Conn. R2 6.775
Harvey,Ill. B5 6.325
Lackawanna,N.Y. B2 6.325
Mansfield,Mass. B5 6.775
Massillon,O. R2 R8 6.325
Midland,Pa. C18 6.325
Monaca,Pa. S17 6.325
Newark,N.J. W18 6.65
Plymouth,Mich. P5 6.525
So.Chicago,Ill. R2, W14 6.325
SpringCity,Pa. K3 6.475
Struthers,O. Y1 6.325
Warren,O. C17 6.325
Waukegan,Ill. A7 6.325
Worcester,Mass. A7 6.625
Youngstown F3, Y1 6.325

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 4.15
Atlanta A11 4.40
Buffalo R2 4.15
Cleveland R2 4.15
Emeryville,Calif. J7 4.90
Fairfield,Ala. T2 4.15
Fairless,Pa. U5 *4.80*
Fontana,Calif. K1 4.85
Gary,Ind. U5 4.15
Houston S5 4.65
Ind.Harbor,Ind. I-2, Y1 4.15
Johnstown,Pa. B2 4.15
KansasCity,Mo. S5 4.85
Lackawanna,N.Y. B2 4.15
LosAngeles B3 4.85
Milton,Pa. B6 4.15
Minnequa,Colo. C10 4.75
Niles,Calif. P1 4.85
Pittsburg,Calif. C11 4.85
Pittsburgh J5 4.15
SandSprings,Okla. S5 5.05
Seattle B3, N14 4.90
So.Chicago,Ill. R2 4.15
So.Duquesne,Pa. U5 4.15
So. SanFrancisco B3 4.90
SparrowsPoint,Md. B2 4.15
Sterling,Ill. (1) N15 4.15
Struthers,O. Y1 4.15
Torrance,Calif. C11 4.85
Youngstown R2, U5 4.15

BARS, Reinforcing
(Fabricated; to consumers)
Johnstown, ¼-1" B2 5.55
KansasCity S5 6.35
LosAngeles B3 6.18
Marion,O. P11 5.55
Seattle N14 5.80
Seattle B3 6.25
So.SanFrancisco B3 6.25
SparrowsPt. ½-1" B2 5.55
Williamsport,Pa. S19 5.45

RAIL STEEL BARS
Avis,Pa.(4) J8 4.75
ChicagoHts.(3) C2 4.50
ChicagoHts.(4) C2 4.75
ChicagoHts.(3,4) I-2 4.50
FortWorth,Tex.(26) T4 4.65
Franklin,Pa.(3) F5 4.50
Franklin,Pa.(4) F5 4.75
Marion,O.(3) P11 4.50
Moline,Ill.(3) R2 4.50
Tonawanda(3,4) B12 5.00
Williamsport,Pa.(3) S19 5.25
Williamsport,Pa.(4) S19 5.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14 10.40
Economy,Pa.(D.R.)B14 12.90
Economy(Staybolt) B14 13.20
McK.Rks.(Staybolt) L5 15.50
McK.Rks.(S.R.) L5 10.40
McK.Rks.(D.R.) L5 14.00

—SHEETS—

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 3.925
Allenport,Pa. P7 3.925
Ashland,Ky.(8) A10 3.925
Butler,Pa. A10 3.925
Cleveland J5, R2 3.925
Conshohocken,Pa. A3 4.05
Detroit M1 4.40
Ecorse,Mich. G5 4.125
Fairfield,Ala. T2 3.925
Fairless,Pa. U5 4.025
Fontana,Calif. K1 4.70
Gary,Ind. U5 3.925
Geneva,Utah C11 4.025
GraniteCity,Ill. G4 4.125
Ind.Harbor,Ind. I-2, Y1 3.925
Irvin,Pa. U5 3.925
Kokomo,Ind. C16 *4.025*
Lackawanna,N.Y. B2 3.925

Munhall,Pa. U5 .....3.925
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.625
Pittsburgh J5 .....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. W14 ..3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ..4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ..3.925
Youngstown U5, Y1 ..3.925

SHEETS, H.R. (19 gage)

AlabamaCity,Ala. R2..5.225
Dover,O. R1 .....5.80
Mansfield,O. E6 .....5.80
Niles,O. N12 .....5.20
Torrance,Calif. C11 ..5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 ....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....*6.10*
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 ....7.00
Gary,Ind. U5 .....5.90
Ind.Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ....5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So. Chicago,Ill. U5 ....5.90
SparrowsPoint(38) B2..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 ....6.175
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind.Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.775
Butler,Pa. A10 .....4.775
Cleveland J5, R2 ....4.775
Ecorse,Mich. G5 .....4.975
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..5.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind.Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ..5.725
Pittsburgh J5 .....4.775
SparrowsPoint,Md. B2 4.775
Steubenville,O. W10 ..4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ....4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ....7.225
Ecorse,Mich. G5 .....*7.425*
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1 7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ..7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.475
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 .....5.275
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2..5.275
Ashland,Ky. (8) A10 ..5.275
Canton,O. R2 .....5.275
Dover,O. R1 .....5.925
Fairfield,Ala. T2 ..5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ....5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind.(13) C16..5.375
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.80
Pittsburg,Calif. C11 ..6.025†
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 5.275
Steubenville,O. W10 ..5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275†

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2..8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky.	A10 6.325	....
Canton,O.	R2 ...6.475	6.925
Fairfield	T2 ...6.075	6.325
Gary,Ind.	U5 ...6.075	6.325
Ind.Harbor	I-2 ...6.075	6.325
Irvin,Pa.	U5 ...6.075	6.325
Kokomo,Ind.	C16 6.525	....
MartinsFry.	O.W10 6.075	....
Pitts.,Cal.	C11 ...6.825	....
SparrowsPt.	B2 ...6.075	....
Torrance,Cal.	C11 6.825	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky.	A10 ....6.575
Fairfield,Ala.	T2 ....6.325
MartinsFerry,O.	W10 ..6.325

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind.(13) C16..5.925
Niles,O. N12 .....6.35

†Based on 5c zinc.

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ....5.375
Ind.Harbor,Ind. I-2 ....5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 .....7.20
Follansbee,W.Va. F4 ..7.30
Follansbee (23) F4 ..7.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....5.675
Niles,O. N12 .....6.00
Weirton,W.Va. W6 ....5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 ....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27)	R2 3.925
Allenport,Pa. P7	*3.925*
Alton,Ill.	L1 4.10
Ashland,Ky.(8)	A10 3.925
Atlanta	A11 4.175
Bessemer,Ala.	T2 3.925
Bridgeport,Conn.(10)	S15 4.15
Buffalo (27)	R2 3.925
Butler,Pa. (8)	A10 3.925
Carnegie,Pa.	S18 4.425
Conshohocken,Pa.	A3 4.05
Detroit	M1 4.40
Ecorse,Mich.	*G5 4.425*
Fairfield,Ala.	T2 3.925
Fontana,Calif.	K1 4.70
Gary,Ind.	U5 3.925
Houston,Tex.	S5 4.425
Ind.Harbor,Ind.	I-2,Y1 3.925
Johnstown,Pa.(25)	B2 3.925
KansasCity,Mo.(9)	S5 4.625
Lackawna,N.Y.(32)	B2 3.925
LosAngeles(25)	B3 4.675
Milton,Pa.	B6 3.925
Minnequa,Colo.	C10 5.025
NewBritain(10)	S15 4.15
N.Tonawanda,N.Y.	B11 3.925
Pittsburg,Calif.	C11 4.675
Riverdale,Ill.	A1 3.925
SanFrancisco	S7 5.10
Seattle(25)	B3 4.925
Seattle	N14 4.925
Sharon,Pa.	S3 3.925
So.Chicago,Ill.	W14 3.925
So.SanFrancisco(25)	B3 4.675
SparrowsPoint,Md.	B2 3.925
Torrance,Calif.	C11 4.675
Warren,O.	R2 3.925
Weirton,W.Va.	W6 4.025
Youngstown	Y1, U5 3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)	S15 6.45
Carnegie,Pa.	S18 6.45
Fontana,Calif.	K1 7.80
Gary,Ind.	U5 6.40
Houston,Tex.	S5 6.90
KansasCity,Mo.	S5 7.10
LosAngeles	B3 7.60
NewBritn.,Conn.(10)	S15 6.45
Sharon,Pa.	S3 6.40
So.Chicago	W14 6.40
Youngstown	U5 6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala.	T2 5.65
Conshohocken,Pa.	A3 5.90
Ecorse,Mich.	*G5 6.15*
Fairfield,Ala.	T2 5.65
Fontana,Calif.	K1 7.05
Gary,Ind.	U5 5.95
Ind.Harbor,Ind.	I-2 5.95
Ind.Harbor,Ind.	Y1 6.45
Lackawanna,N.Y.	B2 6.00
LosAngeles(25)	B3 6.40
Seattle(25)	B3 6.65
Sharon,Pa.	S3 5.95
So.SanFrancisco(25)	B3 6.40
SparrowsPoint,Md.	B2 6.00
Warren,O.	R2 5.95
Weirton,W.Va.	W6 6.30
Youngstown	Y1 6.45
Youngstown	U5 5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8)	A10 4.175
Warren,O.	R2 4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind.	G6 5.80
Bridgeprt,Conn.(10)	S15 6.15
Butler,Pa.	A10 5.45
Cleveland	A7, J5 5.45
Dearborn,Mich.	D3 5.75
Detroit	D2, P20 5.70
Detroit	M1 5.65
Dover,O.	G6 5.80
Ecorse,Mich.	G5 5.65
Follansbee,W.Va.	F4 5.45
Fontana,Calif.	K1 7.35
FranklinPark,Ill.(40)	T6 5.70
Ind.Harbor,Ind.	I-2 5.70
Lackawanna,N.Y.	B2 5.45
LosAngeles	C1 7.50
Mattapan,Mass.	T6 6.30
Middletown,O.	A10 5.45
NewBedford,Mass.	R10 6.40
NewBritain(10)	S15 6.15
NewCastle,Pa.	B4 5.45
NewCastle,Pa.	E5 5.95
NewHaven,Conn.	A7 5.95
NewHaven,Conn.	D2 6.20
Pawtucket,R.I.	R3 6.80
Pawtucket,R.I.(21)	N8 6.65
Riverdale,Ill.	(40) A1 5.70
Rome,N.Y.(29)	R6 5.45
Sharon,Pa.	S3 5.45
SparrowsPoint,Md.	B2 5.45
Trenton,N.J.	R5 7.00
Wall'ford,Conn.	W2(30) 6.40
Warren,O.(40)	T5 5.95
Warren,O.	B9 5.75
Warren,O.	R2 5.45
Weirton,W.Va.	W6 5.45
Worcester,Mass.	W19 7.05
Youngstown	C8 5.95
Youngstown	Y1 5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)	S15 12.15
Carnegie,Pa.	S18 12.00
Cleveland	A7 12.00
Dover,O.	G6 12.00
Fontana,Calif.	K1 13.65
Harrison,N.J.	C18 12.00
NewBritn,Conn.(10)	S15 12.15
Pawtucket,R.I.(11)	N8 12.15
Pawtucket,R.I.(12)	N8 12.45
Sharon,Pa.	S3 12.00
Worcester,Mass.	A7 12.30
Youngstown	C8 12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland	J5 7.80
Cleveland	A7 8.15
Dearborn,Mich.	D3 7.90
Dover,O.	G6 8.00
Ecorse,Mich.	*G5 8.15*
Lackawanna,N.Y.	B2 8.15
Sharon,Pa.	S3 7.65
SparrowsPoint,Md.	B2 8.15
Warren,O.	R2 7.60
Weirton,W.Va.	W6 8.30
Youngstown	Y1 8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electrogalvanized

Dover,O.	G6 5.70
Warren,O.	T5 5.70
Weirton,W.Va.	W6 5.45
Youngstown	C8 5.95

TIGHT COOPERAGE HOOP

Atlanta	A11 4.65
Riverdale,Ill.	A1 4.50
Sharon,Pa.	S3 4.35
Youngstown	U5 4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., WickWire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Lacledo Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Milltrip Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Electric Steel
N2 National Supply Co.
N4 National Tube Div.
N5 Neisen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod. Steel Strip Corp.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U1 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West Auto Mach. Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.60	8.60	10.55	12.85
Bridgeport,Conn. C10	S15 6.15	8.60	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	...
Carnegie,Pa. S18	...	8.60	8.60	10.55	12.85
Cleveland,A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.75	7.85	8.80	...	...
Detroit,D2	6.45	7.85	8.45	10.55	...
Dover,O. G6	6.05	8.60	8.60	10.55	12.85
Franklin Park,Ill. T6	5.80	7.80	8.75	10.70	...
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn. C10	S15 6.15	8.00	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	...	...
NewCastle,Pa. E5	5.95	8.00	8.60	10.55	12.85
NewHaven,Conn. I2	6.70	7.95	8.55	10.50	...
NewYork W3	...	...	8.30	8.90	10.85	13.15
Pawtucket,R.I. N8					
Cleve.orPitts.Base	...	8.00	8.60	10.55	12.85
Worcester,Mass.,Base	6.65	7.95	8.90	10.85	13.15
Sharon,Pa. S3	5.45	7.65	8.60	10.55	12.85
Trenton,N.J. R5	...	8.30	8.90	10.85	13.15
Wallingford,Conn. W2	6.65	7.95	8.90	10.85	13.15
Warren,O. T5	6.20	8.00	8.60	10.55	12.85
Weirton,W.Va. W6	5.80	8.00	8.60	10.55	12.85
Worcester,Mass. A7	6.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown,O. S.	...	8.00	8.60	10.55	12.85
Spring Steel (Tempered)					
Bristol,Conn. W1			12.50	15.00	...
Franklin Park,Ill. T6			12.50	15.00	18.00
Harrison,N.J. C18			12.50	15.00	18.00
NewYork W3			12.50	15.00	18.00
Trenton,N.J. R5			12.50	15.00	18.00
Worcester,Mass. T6			12.50	15.00	18.00
Youngstown,O. S.			12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R. (22 Ga.) COILS (cut lengths 1/2c lower)	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
Granite City,Ill. G4 (cut lengths)	...	...	8.50	9.80	...
Indiana Harbor,Ind. I-2	8.05	8.35	8.85	(34)	...
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	7.85	8.35	...	...
Vandergrift,Pa. U5	...	...	8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	...	8.35	8.85	10.10	10.90

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths 1/2c lower)	Transformer Grade 72	65	58	52
Beech Bottom,W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	...	...	...
Newport,Ky. N9 (cut lengths)	10.95	...	...	...
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	...	...	...
Zanesville,O. A10	11.45	12.00	12.70	13.50

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
Granite City,Ill. G4	7.60	7.85	8.25
Indiana Harbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
Sparrows Point,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American 1.25 Coke (Base Box)	lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va. W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
Granite City,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
Sparrows Point,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)	
Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
Granite City,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.50

MANUFACTURING TERNES (Special Coated)	
Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8-lb (Commercial Quality)	
Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb	
Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)	
Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon	
Alabama City,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.50
Atlanta,A11	5.775
Bartonville,Ill. K4	5.625
Buffalo,W12	5.525
Chicago,W13	5.525
Cleveland,A7, C20	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. (24) S1	5.75
Houston,S5	5.925
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
Kansas City,Mo. S5	6.125
Kokomo,Ind. C16	5.625
Los Angeles,B3	6.45
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda,B11	5.525
Palmer,Mass. W12	5.525
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.San Francisco,C10	6.475
Sparrows Point,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Torrance,Calif. C11	6.475
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.525

WIRE, MB Spring, High Carbon	
Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo,W12	6.925
Cleveland,A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
Mullbury,Mass. (12) N6	8.725
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.San Fran. C10	7.875
Sparrows Pt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester,A7, J4	7.225
Worcester,T6, W12	7.225

WIRE, Upholstery Spring	
Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo,W12	6.625
Cleveland,A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
Los Angeles,B3	7.375
Minnequa,Colo. C10	6.875
Monessen,Pa. P7, P16	6.925
New Haven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.375
Portsmouth,O. P12	6.925
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.925
So.San Francisco,C10	7.375
Sparrows Point,Md. B2	6.725
Torrance,Calif. C11	7.375
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.925
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8 Coils)	
Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo,W12	10.55
Chicago,W13	10.55
Cleveland,A7	10.55
Crawfordsville,Ind. M8	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.San Francisco,C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores	
Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
Sparrows Pt.,Md. B2	9.60

ROPE WIRE (A)	
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.35
Buffalo,W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
Sparrows Pt., B2	9.45
Struthers,O. Y1	9.35
Worcester,J4, T6	9.65

(A) Plow and Mild Plow; add 0.2c for improved plow.

WIRE, Tire Bead	
Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat	
Anderson,Ind. G6	7.45
Buffalo,W12	7.45
Cleveland,A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
Franklin Park,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	8.00
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester,A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)	An'ld. Galv.
Ala.City,R2	6.675 7.075**
Aliquippa,J5	6.675 7.20*
Atlanta,A11	6.925 7.475
Bartonville(10)K4	6.675 7.225
Buffalo,W12	6.675 7.075
Cleveland,A7	6.675 ...
Crawfordsville,M8	6.775 7.325
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield,T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
Johnstown(24)B2	6.675 7.225
Joliet,Ill. A7	6.675 7.075†
Kansas City,Mo. S5	7.275 7.675
Kokomo,Ind. C16	6.775 7.175
Los Angeles,B3	7.625 ...
Minnequa,Colo. C10	6.925 7.325**
Monessen,P7(48)	6.675 7.225
Palmer,Mass. W12	6.975 7.375
Pitts.,Calif. C11	7.625 8.025†
Pittsmth.(18) P12	6.675 ...
Rankin,Pa. A7	6.675 7.075†
So.Chicago,Ill. R2	6.675 7.075**
So.S.Fran.(48) C10	7.625 8.025**
Spar'wsPt.,Md. B2	(48)6.775 7.325
Sterling(10)(48) N15	6.675 7.225
Struthers,O. Y1	6.675 7.175
Worcester,A7	6.975 ...

* Based on 10c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE (16 gage)	An'ld. Galv. Stone	Galv. Stone
Ala.City,R2	12.50	14.05**
Aliquippa,J5	10.63	12.72*
Bartonville(10)K4	10.73	12.51
Cleveland,A7	12.50	...
Crawfordsville,Ms	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown,B2	12.50	14.35
Kokomo,C16	12.60	14.15
Minnequa,C10	12.75	14.45**
Palmer,Mass. W12	12.50	14.05
Pitts.,Calif. C11	12.85	14.40†
So.Chicago,R2	12.50	14.05**
Sparrows Pt.,B2	12.60	14.45
Sterling(1) N15	10.73	12.15
Waukegan,A7	12.50	14.05†
Worcester,A7	12.80	...

* Based on 11c zinc; † 5c zinc; ** Subject to zinc equalization extras.

WIRE, Barbed	Col.
Alabama City,R2	153**
Aliquippa,J5	150*
Atlanta,A11	156
Bartonville,Ill.(19) K4	156
Crawfordsville,Ind. M8	156
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
Kansas City,Mo. S5	165
Kokomo,Ind. C16	156
Minnequa,Colo. C10	156**
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153**
S.SanFrancisco,C10	173**
Sparrows Point,Md. B2	158
Sterling,Ill.(1) N15	156

* Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.	Col.
Ala.City,Ala. R2	140**
Ala.City 17 ga. R2	235**
Ala.City 18 ga. R2	245**
Aliqp'pa,Pa.9-14½ga. J5	143*
Atlanta,A11	146
Bartonville,Ill.(19)—K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	148
Johnstown,Pa. B2	143
Johnstown 17 ga. 6" B2	234
Johnstown, 4" B2	237
Joliet,Ill. A7	140†
Kansas City,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	148**
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	140**
Sterling,Ill. (1) N15	143

† Based on 5c zinc; * 11c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop	Col.
Alabama City,Ala. R2	149
Atlanta,A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
Kansas City,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.San Fran.,Calif. C10	173
Sparrows Point,Md. B2	151
Sterling,Ill.(1) N15	149

NAILS, Stock To dealers & mfrs. (7)	Col.
Alabama City,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta,A11	134
Bartonville,Ill.(19) K4	131
Chicago,Ill. W15	131
Cleveland,A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
Kansas City,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Portsmouth,O. P12	132
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
Sparrows Pt.,Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) to dealers (33)	
Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock To dealers & mfrs. (7)	Col.
Alabama City,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta,A11	136
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Portsmouth,O. P12	132
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
Sparrows Pt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
Chicago Hts.,Ill. C2, I-2	145
Duluth,Minn. A7 (49)	136
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes, Inches	2		2½		3		3½		4		5		6	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25
Ambridge, Pa. N2 (‡)	15.75	"	19.75	"	22.25	"	23.75	"	23.75	"	23	"	25.5	"
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	25.5	11.25
Youngstown Y1 (‡‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	25.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	25.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes, Inches	⅛		¼		⅜		½		¾		1		1¼		1½	
List Per Ft.	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c	
Pounds Per Ft.	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Alton, Ill. L1 ($)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25
Benwood, W. Va. W10(‡‡)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Butler, Pa. F6 (‡)	26.5	+2.75	19.5	+7.25	12.5	+13	...	...	...	...	...	...	...	...	...	...
Etna, Pa. N2 (‡)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25
Fontana, Calif. ($)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	21.25	5.5	21.75	6.5
Ind. Harbor Y1 (‡‡)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24
Sharon, Pa. S1 (‡)	26.5	−0.25	19.5	+4.25	12.5	+8.5	...	...	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Sparrows Pt., Md. B2 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5
Youngstown R2 (**)	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25
Youngstown Y1 (‡‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5
Wheatland, Pa. W9 (‡)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5

Size, Inches	2		2½		3		3½		4	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft.	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Alton, Ill. L1 ($)	33.25	18.75	34.75	18	34.75	18	...	...	...	...
Benwood, W. Va. W10(‡‡)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. N2 (‡)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 ($)	22.25	7	23.75	7	23.75	7	...	...	...	...
Ind. Harbor, Ind. Y1 (‡‡)	34.25	19	35.75	19	35.75	19	...	...	...	...
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	...	...	...	...
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	...	...	...	...
Sparrows Pt., Md. B2 ($)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (‡‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...

Galvanized pipe discounts based on zinc price of: (‡), 11c; (‡), 11c to under 12c; (*) 5c; ($), 10c to under 11c; (‡‡), 10.50c-11.50c; with discounts adjusted on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	...	21.31	18.44
1¼	13	...	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.47	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2½	12	37.19	44.75	32.41
2½	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	...	5.20
Fairfield,Ala. T2	...	...	...	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	...	...	...	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	...	...	...	4.15 5.20
Lackawanna,N.Y. B2	4.325	4.225	...	5.20
Minnequa,Colo. C10	4.325	4.125	...	5.20
Steelton,Pa. B2	4.325	4.225	...	...
Williamsport,Pa. S19	...	...	...	5.20
TIE PLATES				
Fairfield,Ala. T2	...	...	...	5.125
Gary,Ind. U5	...	...	...	5.125
Ind.Harbor,Ind. I-2	...	...	...	5.125
Lackawanna,N.Y. B2	...	...	...	5.125
Minnequa,Colo. C10	...	...	...	5.125
Pittsburg,Calif. C11	...	...	...	5.275
Seattle,B3	...	...	...	5.275
Steelton,Pa. B2	...	...	...	5.125
Torrance,Calif. C11	...	...	...	5.275
TRACK BOLTS (20) Treated				
KansasCity,Mo. S5	...	...	...	11.00
Lebanon,Pa. B2	...	...	...	11.00
Minnequa,Colo. C10	...	...	...	11.00
Pittsburgh,O3, P14	...	...	...	11.00
JOINT BARS				
Bessemer,Pa. U5	...	...	...	5.275
Fairfield,Ala. T2	...	...	...	5.275
Ind.Harbor,Ind. I-2	...	...	...	5.275
Joliet,Ill. U5	...	...	...	5.275
Lackawanna,N.Y. B2	...	...	...	5.275
Minnequa,Colo. C10	...	...	...	5.275
Steelton,Pa. B2	...	...	...	5.275
AXLES				
Ind.Harbor,Ind. S13	...	...	...	6.50
Johnstown,Pa. B2	...	...	...	6.50

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.50
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh,Pa. J5	7.05
Seattle,B3	7.50
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ⅝-in. larger 8.90c
⅝-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ¾-in.	6
⅞-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	5
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting Up Bolts	25

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	5*
H.P. Hex, regular & heavy:	
⅝" and smaller	58
⅞" to 1¼", inclusive	60
1⅜" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex, regular heavy:	
All sizes	5*
Hot Galv. Nuts (all types):	
⅝" and smaller	40
⅞" to 1½", inclusive	43
Finished Hex Nuts:	
New standard, all sizes	5*
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	5*

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	31
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	31
¼-in. diam. & larger	14
N.F. thread, all diams.	5

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	17.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged, per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.	
⅝-in. and smaller	20
¾-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe, minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns, $3.00-$48.00	
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots	78.00
Brass, 20-ton lots	29.50-36.50
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	43.25
Reduced	42.25
Lead	21.75
Magnesium	75.00-85.00
Manganese:	
Minus 35 mesh	52.00
Minus 100 mesh	57.00
Minus 200 mesh	62.00
Nickel, unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.00*
Zinc, 10-ton lots	17.50-25.00
Tungsten	Dollars
Melting grade, 99% W, 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

*Plus cost of metal

Footnotes

(1) Chicago base.
(2) Angles, flats, bands 1" merchant.
(4) Reinforcing.
(5) 1¼" to 1 7/16"; 1 7/16" to 1 15/16" 4.50c; 1 15/16" to 2 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 2 cols. lower.
(8) 16 gage and heavier 6 in. and narrower.
(9) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 7.80c.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn. base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators, to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; add 0.55c for universal mill.
(32) Bolt or square edge. To jobbers, deduct 20c.
(33) 9.60c for cut lengths.
(34) 72" and narrower.
(35) 48" and narrower.
(36) 15 gage & lighter 60" & narrower.
(38) 14 gage & lighter 48" and narrower.
(39) Lighter than 0.093", 0.25c and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 6.2 gage.
(54) 5 feet; add 2 cols. for 7 feet.
(56) 0.025 gage, 6.75c for 0.026 to 0.005 gage, 5.65c for 0.060 gage and over.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	56.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	65.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	16.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co, Inc.; American Steel & Wire Division, U. S. Steel Corp.; Armco Steel Corp.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur D. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Co.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Division, Borg Warner Corp.; Jessop Steel Co.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; Page Steel & Wire Division, American Chain & Cable Co. Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Stainless Welded Products Inc.; Superior Steel Corp.; Timken Roller Bearing Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	.....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	38.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont Del. C22 Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.33-.340	W-Cr Hot Work	0.41
Special Carbon	0.35-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.055
18.25	4.25	1	4.75	....	2.340
18	4	2	9	....	2.565-2.695
18	4	2	....	....	1.820
18	4	1	....	....	1.580-1.660
13.5	4	3	....	....	1.875
6.4	4.5	1.9	....	5	1.065
6	4	3	....	6	1.300
2	1.4	1.2	....	....	0.495
1.5	4	1	....	8.5	0.895

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON, Gross Ton

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward,Ala. W15	52.38	52.88	....	....
Cincinnati, del.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda,N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda,N.Y. T9	....	56.50	57.00	....
Boston, del.	66.65	67.15	67.65	....
Rochester,N.Y., del.	59.02	59.52	60.02	....
Syracuse,N.Y., del.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary,Ind. U5	56.00	....	56.50	....
IndianaHarbor,Ind. I-2	56.00	....	56.50	....
So.Chicago,Ill. W14, Y1	56.00	56.50	56.50	....
So.Chicago,Ill. U5	56.00	....	56.50	57.00
Milwaukee, del.	58.17	58.67	58.67	59.17
Muskegon,Mich., del.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron,O., del. from Cleve.	58.75	59.25	59.25	59.75
Lorain,O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem,Pa. B2	$58.00	$58.50	$59.00	$59.50
New York, del.	....	62.28	62.78	....
Newark, del.	61.02	61.52	62.02	62.52
Philadelphia, del.	60.75	61.25	61.75	62.25
Birdsboro,Pa. B10	58.00	58.50	....	....
Steelton,Pa. B2	58.00	58.50	59.00	59.50
Swedeland,Pa. A3	58.00	58.50	59.00	59.50
Troy,N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Nevillelsland,Pa. P6	56.00	56.50	56.50	....
Pitts.,N.&S. sides, Ambridge, Aliquippa, del.	57.37	57.87	57.87	....
McKeesRocks, del.	57.04	57.54	57.54	....
Lawrenceville, Homestead, Wilmerding, Monaca, del.	57.66	58.16	58.16	....
Verona, Trafford, del.	58.19	58.69	58.69	....
Brackenridge, del.	58.45	58.95	58.95	....
Bessemer,Pa. U5	56.00	....	56.50	57.00
Clairton,Rankin,So.Duquesne,Pa. U5	56.00	....	....	....
McKeesport,Pa. N3	56.00	....	....	57.00
Midland,Pa. C18	56.00	....	....	....
Monessen,Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard,O. Y1	....	....	56.50	....
Sharpsville,Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield,O., del.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie,Pa. I-3	56.00	56.50	56.50	57.00
Everett,Mass. E1	59.50	63.00	63.50	....
Fontana,Calif K1	62.00	62.50	....	....
Geneva,Utah C11	56.00	56.50	....	....
GraniteCity,Ill. G4	57.90	58.40	58.90	....
Ironton,Utah C11	56.00	56.50	....	....
LoneStar,Texas L6	52.00	52.50*	52.50	....
Minnequa,Colo. C10	58.00	59.00	59.00	....
Rockwood,Tenn. T3	....	....	56.50	....
Toledo,O. I-3	56.00	56.50	56.50	57.00
Cincinnati, del.	61.76	62.26	....	....

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson,O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry, freight allowed K2	95.50
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frt. allowed K2	98.50
Wenatchee,Wash., OH & Fdry, freight allowed K2	95.50

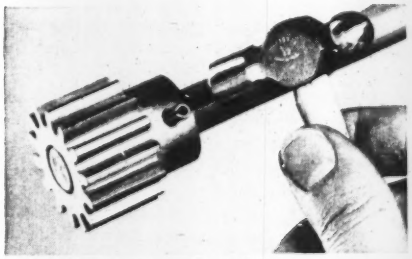
LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood,Tenn. T3	70.00
Steelton,Pa. B2	64.00
Philadelphia, delivered	67.55
Troy,N.Y. R2	64.00

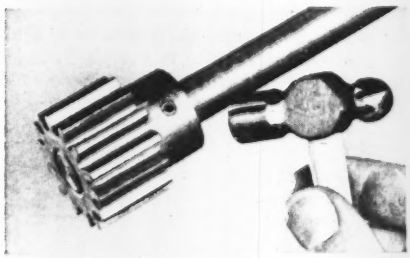
Where can you use this simple fastener?

Rollpin is driven into holes drilled to normal production-line tolerances.

No threading, peening or precision drilling with ROLLPIN



It compresses as driven.



Rollpin fits flush . . . is vibration-proof.

Rollpin is the slotted tubular steel pin with chamfered ends that is cutting production and maintenance costs in every class of industry.

This modern fastener drives easily into standard holes, compressing as driven. Its spring action locks it in place—regardless of impact loading, stress reversals or severe vibration. Rollpin is readily removable and can be re-used in the same hole.

* * *

If you use locating dowels, hinge pins, rivets, set screws —or straight, knurled, tapered or cotter type pins—Rollpin can cut your costs. Mail our coupon for design information.

Elastic Stop Nut Corporation of America
Dept. R16-1060, 2330 Vauxhall Road, Union, N. J.
Please send me the following free fastening information.

☐ Rollpin bulletin
☐ Elastic Stop Nut bulletin
☐ Here is a drawing of our product. What fastener would you suggest?

Name Title
Firm
Street
City Zone State

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 30 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, St. Paul, 15 cents; Seattle and Spokane, Wash., no change.)

	SHEETS			STRIP		BARS				PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§	Standard Structural Shapes	Carbon	Floor
Baltimore	6.20	7.64	7.75	7.00	...	6.86	8.17[4]	12.04	6.98	6.85	7.98
Birmingham	6.10	7.60	8.00[2]	6.30	...	6.15	8.90	....	6.35	6.35	8.65
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.59	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.46
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.65	11.89	6.79	6.50	7.79
Detroit	6.38	7.31	8.29	6.71	7.36	6.56	7.60	11.92	6.93	6.85	7.80
Erie, Pa.	6.19	7.13	9.01	6.54	...	6.28	7.70	....	6.56	6.50	7.79
Houston	7.15	7.60	9.32	7.45	...	7.45	...	....	7.35	7.20	8.55
Jersey City, N.J.	6.54	7.45	8.72	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43[4]	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43[4]	....	6.90	6.99	8.30
Norfolk, Va.	6.90	...	...	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.53	7.55	8.41	7.02	8.80	6.87	8.19[4]	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55	...	6.28	7.65	11.89	6.46	6.33	7.48
Portland, Oreg.	7.90	9.30	10.00	7.90	...	7.60	10.65	....	7.50	7.55	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.88
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	8.70	10.05	8.02	...	7.58	10.13	13.50	7.50	7.59	9.40
Spokane	8.15	9.40[3]	9.80	8.50	...	7.60	10.55[4]	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	...	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed; ** ¼" and heavier, 8.09c for No. 12 and lighter. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; Cold-finished bars, 2000 lb and over; [2]—500 to 9999 lb; [3]—1000 to 1999 lb; [4]—1000 lb and over; [7]—1500 lb to 3499; [8]—under ½ in.

Distributors Improve Stock Position

Inventories are fairly well balanced in most products, exceptions being in wide flange beams, plates and sheets. Demand still exceeds earlier forecasts

Cleveland—District distributors' volume this month will be slightly better than in September on the basis of bookings to date. However, customers are more particular with respect to specifications, no longer being willing to accept substitutes. Consequently, although over-all warehouse stocks are close to normal, they are still unbalanced as regards individual products and sizes, and buyers still must do considerable shopping to fill their needs.

Pressure is definitely off as compared with some months back, and the warehouses are ordering more conservatively from the mills with supply availability easier than it has been for a long time.

Cincinnati—One large distributor reports business down 20 per cent from six months ago, but still surprisingly good. Heavy plates and wide flange beams are becoming more difficult to obtain.

Philadelphia—Leading warehouses anticipate a gain in business this month compared with September. They don't look for any appreciable falling off in November despite the fewer number of working days. Wide flange shapes are in most stringent supply, with light gage plates probably second in point of scarcity. Bar and sheet business is good—helped by the fact most distributors have been able to get their stocks in good balance.

Pittsburgh—Warehouses are tending toward completion of inventory in tubular products and bars. A balanced inventory is still distant in sheet, plate and structural shapes. By the end of the year, warehousemen expect to be in better balance in sheet, strip and plate. Prices, meanwhile, are steady.

Boston—Demand for nickel stainless is below expectations since decontrols starting Nov. 1, permit its use in fabrication of a large number of finished products. Additional stainless in the 300 series will be available from mills by December.

Warehouse inventories are approaching normal on most products, although some have several weeks to go before striking a balance on hot and cold-rolled carbon sheets. Wide-flanged beams are short. Av-

STEEL IMPORT PRICES

(Base, Per 100 Lb, Landed, Duty Paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.86	$4.94	$4.86	$5.14
Bar Size Angles	4.53	4.61	4.53	4.81
Structural Angles	4.53	4.61	4.53	4.81
I-Beams	4.80	4.88	4.80	5.08
Wide Flange Beams	4.94	5.02	4.94	5.22
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	21.30	21.54	21.30	22.14
Barbed Wire	6.10	6.12	6.10	6.33
Merchant Bars	4.81	4.89	4.81	5.09
Hot Rolled Bands	4.97	5.05	4.97	5.25
Wire Rods, Thomas Commercial No. 5	4.68	4.75	4.73	5.00
Wire Rods, O-H, Cold Heading Quality No. 5	5.14	5.21	5.19	5.46
Channels	4.80	4.88	4.80	5.08
Bright Common Wire Nails, 8d	6.40	6.50	6.45	6.70

Seamless A.P.I. Casing, Grade J-55

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.32/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.50/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅜ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of Shipment: Western continental European (Schuman Plan) countries.

erage order placed with distributors is smaller, but because warehouses have more to sell, individual orders are more numerous. Total volume, however, is trailing first half levels.

Seattle — Warehouses report no change in the sheet situation, galvanized being in plentiful supply, cold-rolled easier and hot-rolled almost impossible to obtain. Normal inventories of the latter are not expected before second quarter. Houses dealing in specialized items report excellent turnover.

Los Angeles—Warehouse activity is off from last month. As many orders are being written but the total tonnage per order is less. Warehouse stocks are growing, approaching 85 to 95 per cent of normal.

Great Lakes Adjusts Prices

Pittsburgh—Significance of recent price changes, which included various reductions, announced by Great Lakes Steel Corp., Detroit, subsidiary of National Steel Corp., has been misrepresented, states Ernest T. Weir, chairman, National Steel, commenting on published reports of the changes.

He said the reports created the false impression that the Great Lakes adjustments represented significant reductions in prices on standard steel products, and this definitely was not the case. The reductions applied to a small number of special materials, such as alloy products, special steels and special sections made by Great Lakes, and the effect of the decrease has been to reduce the prices of these products to the going competitive level.

Except in the case of hot-rolled strip, which was decreased $2 per ton to bring it to the competitive level, there has been no change whatsoever in the prices of any of the company's standard products, which are the large tonnage items, stated Mr. Weir.

New prices announced by Great Lakes include: Hot-rolled carbon bars, $4.35; hot-rolled alloy bars, $5.075; bars, high-strength low-alloy, $6.425; strip, hot-rolled carbon, $4.125; strip, cold-rolled high-strength low-alloy, $8.35; hot-rolled carbon plates, $4.30; plates, high-strength low-alloy, $6.45.

All the prices are f.o.b. the Ecorse, Mich., plant, and are subject to the company's standard list of extras.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 175

Seattle—Bethlehem Pacific Coast Steel Corp.'s local nut and bolt plant has a better than average backlog of orders.

Sheet Bookings Assure Active Operations

Market in healthier position despite slackened demand pressure. Sharp inventory reduction by some consumers seen stemming recent downturn in requirements

Sheet and Strip Prices, Page 172 & 173

Cleveland — Although consuming pressure on the sheet market has slackened somewhat, still demand continues robust and the mills, booked virtually full for the fourth quarter, are getting orders in satisfactory volume for first quarter. In fact, some consumers indicate they will need more tonnage than they are being allotted.

Adjustment by Great Lakes Steel Corp., Detroit, of its prices on various flat-rolled products to lower levels than it had been quoting is not seen as any threat to market stability. For the most part the reductions are seen as a move by Great Lakes to protect its home market from inroads by outside producers through freight absorption.

Boston — Only limited spot openings in fourth quarter, December, are open for flat-rolled. Included are hot-rolled strip and stainless. Hot and cold-rolled carbon sheets are available in larger volume and in a broader range of sizes and gages.

Several mills are returning to this area on carbon sheets. Relatively small tonnage involves freight absorption as yet and the bulk of this volume is on a delivery basis.

New York—Despite the decline in automotive requirements, demand for hot and cold sheets, especially the latter, is holding up well. It is becoming apparent some leading buyers have reduced inventories to a point where they are interested in more tonnage.

Philadelphia—Business in hot and cold-rolled sheets is holding up better than anticipated several weeks ago. Little premium tonnage is being moved.

Pittsburgh—Producers' order backlogs are strong well into fourth quarter, and a steady demand is predicted with a good carryover into next year.

Cincinnati—The large mills in this area continue to roll sheets at near capacity levels while smaller producers are running well below normal. One mill is having a tough time selling straight carbon sheets, but is experiencing good business with specialty items, such as silicon sheets.

Chicago — Many consumers of sheets, particularly cold-rolled, are indicating that their requirements for

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One of the best proofs of whether a product is good is whether the maker uses it himself. This picture of five 16-ft multi-plate pipes shows that Armco Steel Corp., Middletown, O., does. The pipes are installed under a heavy-duty rail line running from the company's new $40 million blast furnace to a slag dump. The 160-ton P&H shovel, made by Harnischfeger Corp., will be used at the dump

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first quarter will exceed tonnage which local mills presently are providing.

Continental Steel Corp. announced, effective Oct. 19, it is offering for sale hot-rolled 18-gage and heavier sheets at $1.025 per 100 pounds, f.o.b. Kokomo, Ind.

St. Louis—Sheet demand remains level despite upward signs elsewhere.

Some cancellations on old orders continue, mostly the result of overselling by one mill in anticipation of a temporary shutdown. Jones & Laughlin is reported absorbing freight into the St. Louis area.

Los Angeles — Galvanized sheet dealers are offering 12 gage material at about 10 cents per pound.

Steel Bars . . .

Bar Prices, Page 172

New York—Recently announced price on hot-rolled carbon bars at Fairless, Pa., of $4.30 per 100 pounds, will give the leading producer an advantage on delivered price here, notwithstanding the fact its base price is $3 per ton higher than its nearest competitor. Its delivered price will be 4.857 cents on 40,000 pounds and 4.507 cents on 80,000 pound carlots, as compared with 4.771 cents and 4.633, cents, respectively, on shipments from Johnstown, Pa. Competition will be closer on reinforcing bars.

Philadelphia — Establishment of prices on hot-rolled carbon bars and reinforcing bars at Fairless, Pa., will give the U. S. Steel Corp. an advantage on shipments into this territory despite the fact its prices are $3 per ton higher than those of its leading eastern competitor.

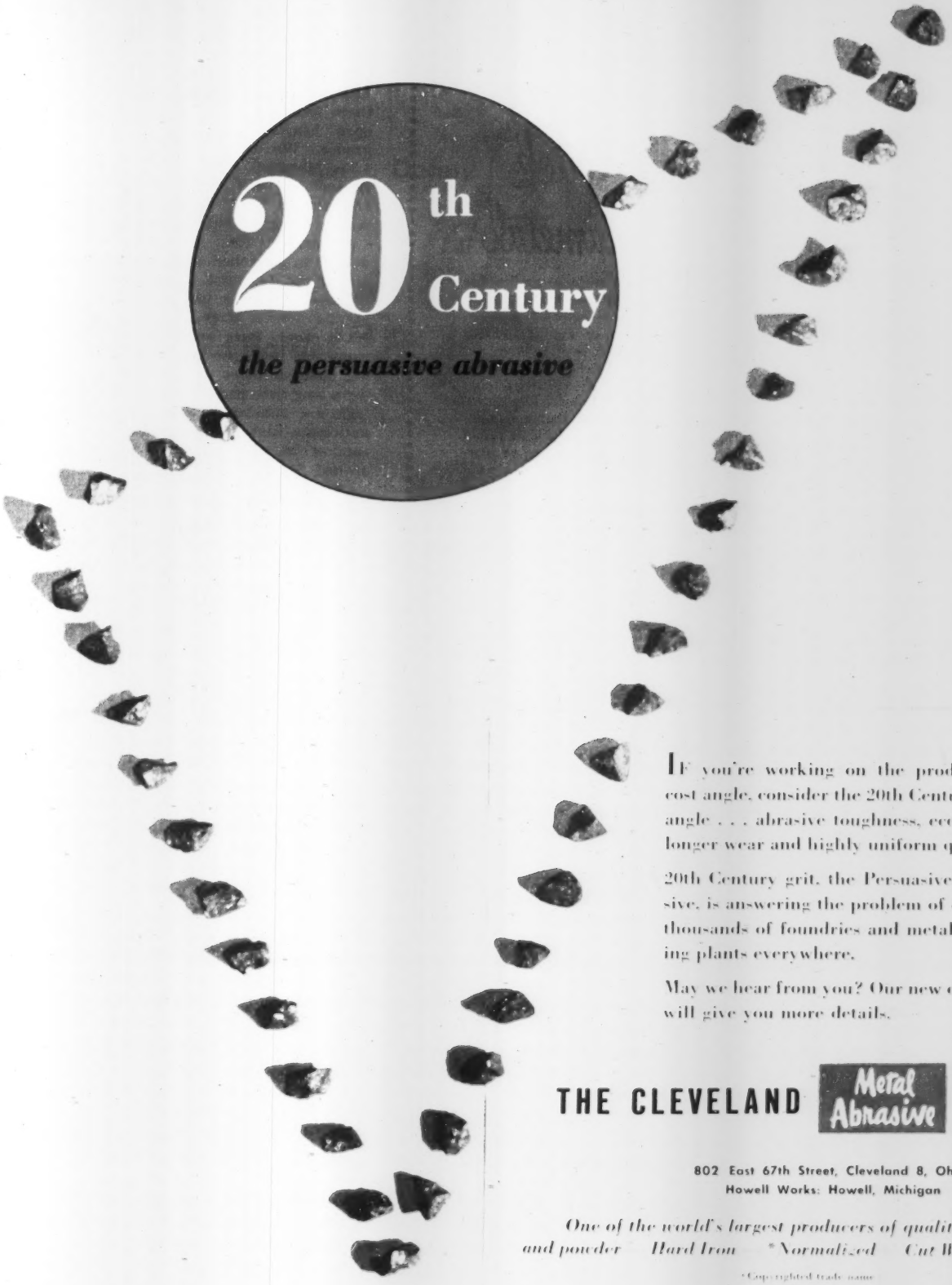
The rail rate from Fairless to Philadelphia on 40,000 pound carlots is 0.138 cent per pound, making for a delivered price of 4.438 cents, and on 80,000 pounds it is 0.1035 cent, making for a delivered price of 4.4035 cents. This compares with a delivered price of 4.702 cents on 40,000 pounds and 4.581 cents on 80,000 pounds from Johnstown, Pa.

The Fairless delivered prices on reinforcing bars compares with 4.483 cents and 4.374 cents on deliveries from Sparrows Point, Md.

Bar production at Fairless will begin in November but size ranges will be limited for a while.

Boston—One Pittsburgh producer is absorbing freight on cold-finished carbon bars, but not hot-rolled. Cold-drawn carbon inventories are getting into balance, not only smaller sizes, but larger rounds.

Converters are more selective in specifying hot-rolled. They have



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some stock, placing orders against requirements not covered by stock lists. Alloy demand is slow and there are openings for December in open hearth and electric furnace grades. With hot-rolled carbon bars 4.30c, Morrisville, Pa., delivered price Boston is 4.76c compared with 4.748c from Buffalo, carlots, federal tax excluded.

Pittsburgh—The inventory-caused decline in hot-rolled bar business has almost run its course, a producer here believes, and the market is nearing its normal strength.

Cleveland—Bars are moving more sluggishly and producers are seeking business more aggressively than for a long time past. Still, order backlogs are substantial and the mills anticipate high-level operations over coming months. Books have been opened for first quarter.

Chicago—Tightness in bars, which persisted so long has now disappeared. It has come about principally by barmakers serving the farm equipment industry making tonnage available to users they normally do not serve. Any appreciable pickup in demand could restore tightness in short order.

Plates . . .

Plate Prices, Page 172

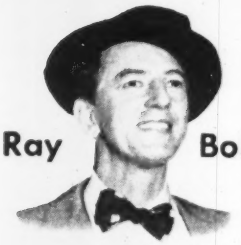
Chicago—From all indications plate requirements are going to continue heavy during first quarter. Prospects are they will exceed output so that producers will be obliged to adhere to quotas.

Boston—Floor plates excepted, demand for carbon grades fills fourth quarter mill schedules. Pressure for tonnage has eased, however, notably in heavier sizes. This is partly due to cutbacks in weldment orders and backlogs.

New York—Demand for some end-use applications is slowing up, but plate fabricators are still pressing fairly hard for tonnage. Their inventories continue out of balance. They haven't shown too much interest yet in first quarter and, actually, some mills are now only opening their books for that period. But consumers are pushing for tonnage against commitments for the current quarter. Only in a few instances have there been requests for deferments.

Philadelphia—Considerable plate tonnage continues to be placed, but some premium-price mills are still able to enter tonnage for shipment in current quarter. Most mills anticipate virtual capacity operations.

Pittsburgh—Both heavy and light plate remain in strong demand, with no signs of declining business this year.



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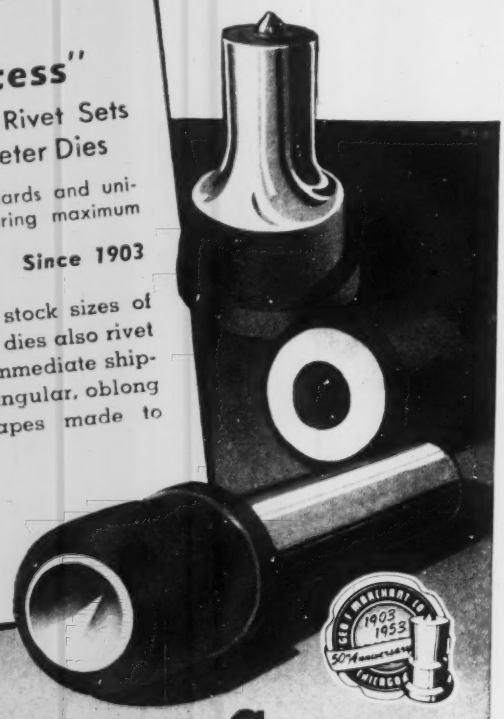
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Wire . . .

Wire Prices, Page 174

Pittsburgh — Manufacturers wire sales are enjoying a slight pickup, with more inquiries reported by producers.

Merchant wire sales are expected to remain slow through fourth quarter because of decreased buying by farmers.

Boston—For screws and other cold-headed products, wire and rod users are not buying beyond 60-day inventory basis. Fourth quarter demand is concentrated on specifications wanted, of fill-in character. This policy is expected to continue through balance of this year. Freight absorption is more prevalent on wire products, including some Pittsburgh tonnage.

Tin Plate . . .

Tin Plate Prices, Page 174

Washington—Shipments of metal cans in August amounted to 506,215 net tons, compared with a revised figure of 446,772 in July, and 465,820 in August, 1952, according to the Bureau of Census. Total for the first eight months was 2,721,965 net tons, against 2,524,922 in the corresponding period last year, increase of about 8 per cent.

Chicago — Slackening demand for tin plate, coupled with generous inventories, has now reached the point where output will be cut back. One important maker in this district is preparing to drop operations below full capacity toward yearend.

Structural Shapes . . .

Structural Shape Prices, Page 172

Boston—Only wide-flanged beams give structural fabricators concern as to plain material supply. Cutbacks on December standard structural tonnage at Lackawanna are without serious result.

While one West Virginia mill is now rolling three sizes of wide flanged beams, no additional tonnage is available.

New York — District structural shops are active. There is some seasonal decline in bookings but most fabricators, especially the larger ones, have enough tonnage to carry them through the winter.

The New Jersey Turnpike Commission will close bids Dec. 8 on 25,000 tons for a bridge over Newark Bay.

Philadelphia—Structural demand is moderately active with inquiry outstripping orders at present.

Pittsburgh — Continued construction activity in this district has made most shapes, especially wide flange beams, even more difficult to obtain.

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—Payroll Savers hold their Bonds: 75% of the $7,400,000,000 Series E Bonds which had matured up to June 30, 1953, were being retained by their owners beyond maturity under the automatic extension program.

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Iron Ore . . .

Iron Ore Prices, Page 195

Cleveland—Weekly movement of iron ore from the head of the lakes is slowing down but still tops the 2 million ton mark. Shippers are less confident the season's goal of 100 million tons will be attained since some 30 carriers already have been taken out of service, chiefly for repairs. The Lake Superior Iron Ore Association reports shipments in the week ended Oct. 19 were 2,618,869 gross tons, comparing with 2,716,978 tons in the preceding week.

Movement in the latest week brought the season's total shipments to date to 86,205,786 gross tons. This is 26,438,855 tons above cumulative shipments in the like period of the 1952 lake shipping season.

Pig Iron . . .

Pig Iron Prices, Page 176

Boston—Mystic Iron Works is supplying basic consumers with that grade at the usual 50-cent differential under foundry iron f.o.b. furnace, Everett, Mass.

Foreign iron is also offered, including Swedish, as low as $19, cars dock.

Foundry and malleable shipments hold at about the consumption rate, well below capacity; few shops indicate substantial expansion of inventory for winter. Stockpile at Everett is the heaviest in many months.

New York—While some foundries have let inventories reach a point where replenishment is desirable, the general movement of pig iron in this district shows little gain.

Washington—The Interstate Commerce Commission has docketed for consideration an application for relief from the long-and-short haul provision of Section 4 (1) of the Interstate Commerce Act on pig iron from Daingerfield, Lone Star and McCrossin, Tex., to points in Indiana, Maryland, Michigan and Ohio. The application has been filed as F. R. Doc. 53-8797.

It has filed as F. R. Doc. 53-8806 an application for relief on freight rates on iron and steel articles to and from the southwestern territory including Kansas on the one hand and points in western trunk-line, official and southern territories on the other.

Cleveland—Merchant iron sellers are looking for new business with foundry operators watching inventories closely and ordering only against requirements.

All 10 local blast furnaces are blowing. Republic Steel Corp., how-

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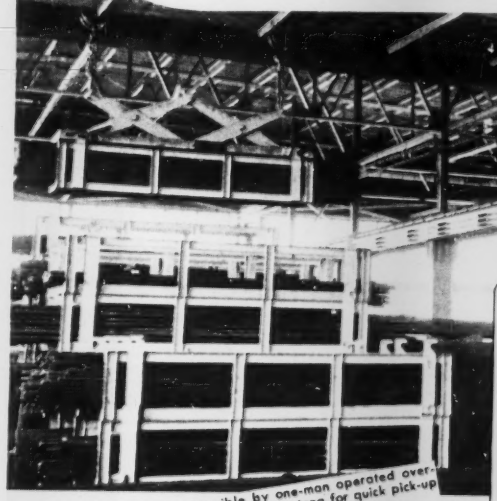

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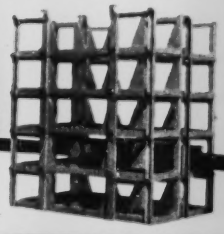

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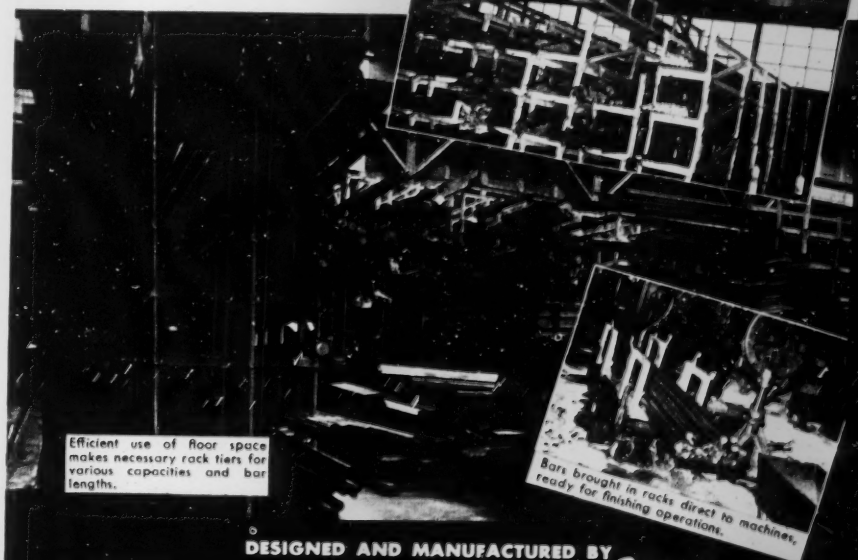

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ever, last week announced it had shut down its Troy, N. Y., stack Oct. 19 for relining. This furnace has operated on the present lining for more than 9 years, during which time it produced 1,800,000 tons of iron. The stack will be out of production 45 days.

Philadelphia—Pig iron business remains spotty. Foundrymen appear more optimistic over the future but they have not stepped up their purchasing in any appreciable degree, notwithstanding the fact that inventories at some plants are gradually being reduced.

Pittsburgh—Merchant pig iron sales are at their lowest ebb of the year. Market sources in this area say there is no activity at all. No. 2 blast furnace of Crucible Steel Co. of America at Midland, Pa., was closed Oct. 14 for relining.

Cincinnati—Inventory restrictions are having a depressing effect on the pig iron market. Prices appear firm, however.

Chicago—Slack foundry operations are curbing demand for pig iron and, currently, more iron is being produced than is being consumed. Inventory reduction is being practiced.

St. Louis—Pig iron demand has reached an extreme low, with two major foundry consumers in the district shut down or curtailed.

Ferroalloys . . .

Cleveland—Construction of facilities for quarrying and processing limestone for metallurgical and other use is now under way in Presque Isle county, Mich., for the Presque Isle Corp., owned jointly by the Bethlehem Steel Corp., Jones & Laughlin Steel Corp., National Steel Corp., Republic Steel Corp., and Youngstown Sheet & Tube Co.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 195

Birmingham—Tennessee Coal & Iron Division, U. S. Steel Corp., has contracted for construction of 63 coke ovens at its Fairfield, Ala., works. The Koppers Co., Pittsburgh, will build the ovens.

Tubular Goods . . .

Tubular Goods Prices, Page 175

Pittsburgh—Seamless products for oil companies may reach record sales this month. Fourth quarter demand appears steady for alloy as well as carbon seamless tubing. Seamless specialties are less reassuring owing to customer readjustment of inventory.

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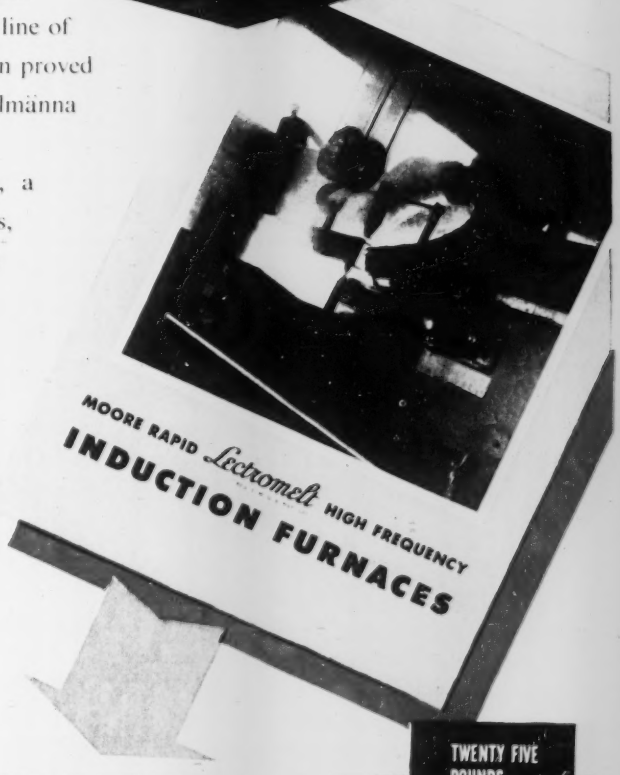

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Steel Shipped To Users At Record Rate

Movement from mills in first 8 months this year sets new mark for any like period. August tonnage off from July but above year ago. Automotive requirements lead

New York—Shipments of steel products totaling 55,432,982 net tons in the first eight months this year set a record for any similar period, reports the American Iron & Steel Institute.

The total was an increase of 14,739,000 tons, or 36 per cent, over shipments in the corresponding period of 1952, and was 2,675,000 net tons greater than the movement in the like period of 1951.

August shipments amounted to 6,498,605 net tons, up 187,000 over August, 1952, but a decrease of about 84,000 tons from July this year.

All the principal classes of domestic purchasers obtained more steel in the first eight months this year than in the like 1952 period, but direct shipments from the mills for export fell off 219,000 tons to a total of 1,807,000.

Chief beneficiary this year has been the automotive industry, its gain being 76 per cent to a total of 10.7 million tons, amounting to 20 per cent of total domestic shipments as against 15.7 per cent last year.

Almost as great a gain in percentage was the increase of 75 per cent in shipments to makers of appliances, to a total of 1.4 million tons.

Other outstanding increases were 45 per cent to other domestic and commercial equipment, 44 per cent to aircraft, 50 per cent to electric apparatus and 65 per cent to military items. These are all among the relatively small users of steel.

Warehouses obtained nearly 10.2 million tons in the eight months, 19 per cent of total domestic shipments.

Scrap . . .

Scrap Prices, Page 198

Washington—Stocks of ferrous materials (scrap and pig iron) held by consumers on Aug. 31 reached a new record high of 8,238,000 gross tons, reports the Bureau of Mines.

Purchased scrap stocks totaled 4,728,000 gross tons, an increase of 167,000 over July; home scrap totaled 1,396,000 tons, largest quantity since Oct. 31, 1950. Pig iron stocks increased 3 per cent over the previous month and totaled 2,114,000 tons for a record inventory.

Preliminary consumption figures for August indicate an increase over July. Purchased scrap use totaled 2,586,000 gross tons; home scrap 3,021,000, and pig iron 5,672,000 tons, a total melt of 11,279,000 gross tons.

Washington—The Commerce Department, in response to heavy pressure from scrap dealers, has agreed to permit exports of all grades of iron and steel scrap during fourth quarter. Action was announced by Assistant Secretary Anderson, who emphasized the new policy applies only to the present quarter. He hinted, however, that the relaxed policy may be continued next year.

New York—Scrap brokers' buying prices are higher, due to slow collections at recent low prices and also the fact mills are showing livelier interest now that operations are holding up better than anticipated. Open-ending of export shipments to friendly countries is having some effect also.

Buffalo—One of the three leading mill consumers and a number of smaller buyers placed new orders for scrap at prices ranging from $1 to $2 a ton higher.

Philadelphia—Scrap consumers and dealers are marking time pending developments, particularly with regard to the lifting of the export ban on scrap shipments. Open-ending of shipments is for the remainder of this year only. Licenses will be required.

General opinion is that supplies in this district will not be too greatly affected. Japan is regarded as the largest potential buyer, largely looking to the Pacific Coast and the Gulf ports. England might also be a good buyer, principally at Southern ports, also the West Coast. North Atlantic districts will likely be affected to some extent, however.

There is no question the tone of the market is definitely stronger, because of the possible influence of the lifting of the export ban, and also the fact supply at recent low price levels has been drying up, especially on major open-hearth grades.

Actually, prices are higher on No. 1 busheling at $34 delivered, and on electric furnace bundles at $35. Rail crops are higher at $45 to $46 delivered.

Pittsburgh—Prices are steady following a moderate recovery from last month's lows. Market activity declined, but prices of No. 2 heavy melt-

(Please Turn to Page 197)

OTTAWA OSP INC. STEEL PRODUCTS

For 25 YEARS

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OTTAWA STEEL PRODUCTS, INC. GRAND HAVEN, MICH.

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Nothing, absolutely nothing, can raise Cain in a spring shop like wire that does not come up to analysis specified. Take complicated coiling machines like the automatic Torrington or Sleeper-Hartley, feed them steel wire at high speed that is a fraction off grade and wham! . . . you're in serious trouble. Mr. A. H. Peterson, president of Precision Spring Corporation, Detroit, Michigan, prominent spring maker for the auto industry, puts it this way: "Pittsburgh Steel's Wire has good uniformity. That's why we use it. We can depend on this wire to work well in production, ton after ton. Every spring we make must meet the customer's specifications for length, diameter, load, and deflection."

It all adds up to this: Lack of uniformity in steel wire within its specifications for grade can knock the profits out of spring making. One failure in fifty springs can turn it into a loss item. Spring failure in an automobile can put a spring maker out of business.

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Pittsburgh Wire

a product of **Pittsburgh Steel Company**

CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 76-80%) 13.15c per pound of contained Mn, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland Oreg.
(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max) Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr, c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.025% C (simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-45%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down; bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.50c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-30%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract, 1" x D; packed, max 0.50%, carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max) $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less-carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.5c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.6c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquetts: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.40 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max; ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%); Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy; ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

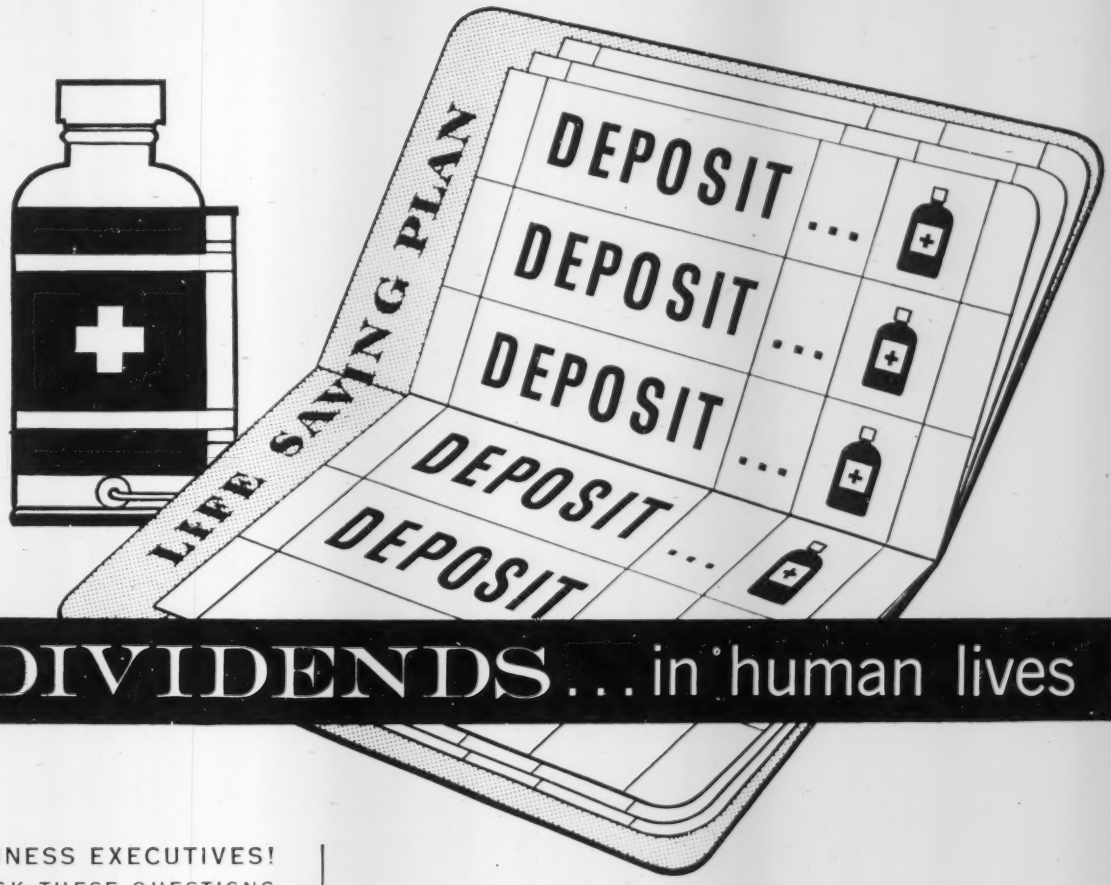
V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb. contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.



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- ◯ HAVE YOU GIVEN YOUR EMPLOYEES TIME OFF TO MAKE BLOOD DONATIONS?
- ◯ HAS YOUR COMPANY GIVEN ANY RECOGNITION TO DONORS?
- ◯ DO YOU HAVE A BLOOD DONOR HONOR ROLL IN YOUR COMPANY?
- ◯ HAVE YOU ARRANGED TO HAVE A BLOOD-MOBILE MAKE REGULAR VISITS?
- ◯ HAS YOUR MANAGEMENT ENDORSED THE LOCAL BLOOD DONOR PROGRAM?
- ◯ HAVE YOU INFORMED EMPLOYEES OF YOUR COMPANY'S PLAN OF CO-OPERATION?
- ◯ WAS THIS INFORMATION GIVEN THROUGH PLAN BULLETIN OR HOUSE MAGAZINE?
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- ◯ HAVE YOU SET UP A LIST OF VOLUNTEERS SO THAT EFFICIENT PLANS CAN BE MADE FOR SCHEDULING DONORS?

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America must give. America is **you**. Won't you call your Red Cross, Armed Forces or Community Blood Donor Center right now, for an appointment?

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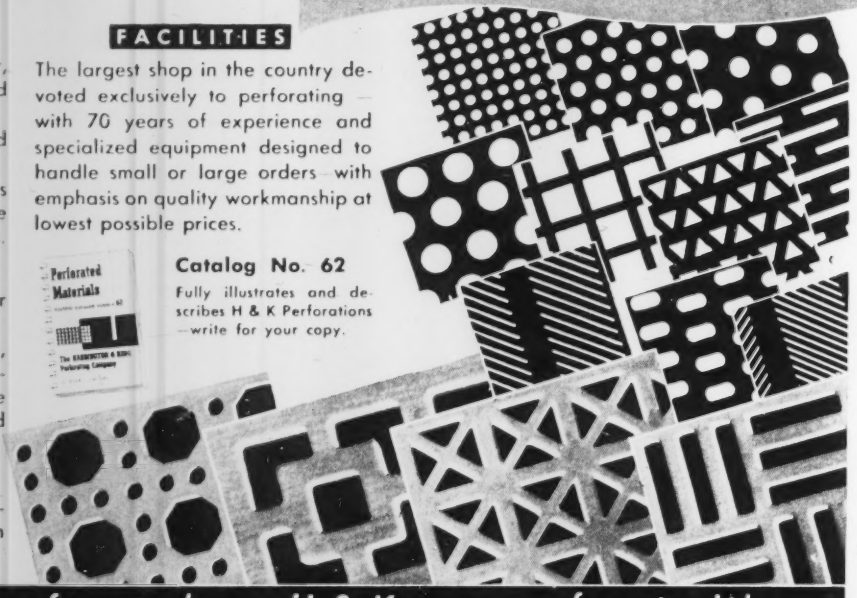

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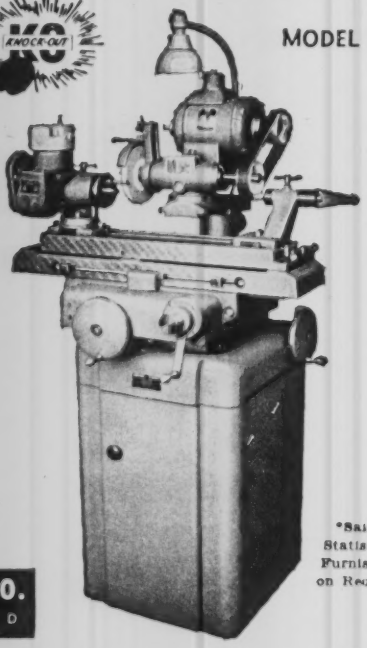

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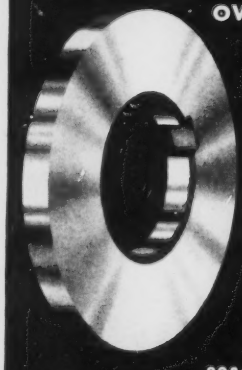

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ORES-COKE-REFRACTORIES

Prices as reported to STEEL; changes shown in italics

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematite (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 65% WO, good commercial quality	$20-$40
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.18-$1.21 per long ton unit, c.i.f. U. S. ports, duty for buyers' account; shipments against old contracts for 48% ore are being received from some sources at 90-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African	
48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom. $32
Domestic (Rail nearest seller)	
48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb Mb content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard	
50-60%	$2.40-$2.80
60% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills	
Domestic	91.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grahn, Hayward, Hitchins, Huttleman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Anegeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., **$115; Warren, O., Hays, Pa., $120; Niles, O., $123;** E. Chicago, Ind., Joliet, Rockdale, Ill., **$125; Cutler, Utah, $116.55, Los Angeles, $122.85.**

Insulating Fire Brick

2300° *F:* Massillon, O., $178.50; **Clearfield, Pa., $213, Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.**

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $109; Los Angeles, $110.25; Pittsburgh, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $174; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $255; Danville, Ill., $258; Clearfield, Pa., $252.

Dolomite

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Marton, Natlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk; Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.80
Wise county, foundry	15.95
Wise county, furnace	15.20
Oven Foundry Coke	
Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, del.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50
Per ton, bulk, ovens	
Sulphate of ammonia	$44-45
Birmingham area	$49.50
Cents per pound, ovens	
Phenol, 40 (c.l., nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded, with nipple, unboxed f.o.b. plant)

GRAPHITE

Diam. Inches	Length	Per 100 lb
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5⅛	40	25.75
6	80	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12 10	60	10.30
8	60	10.55

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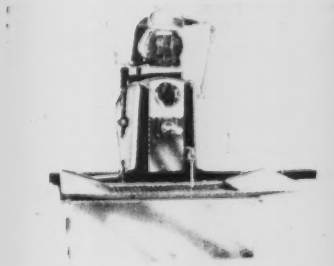

belts. Talk about ease and speed of changing mandrels and stones — no tools are needed! All stones are ground to size.

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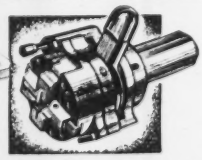

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Scrap . . .

(*Concluded from Page* 190)

ing and No. 2 bundles rose $1 a ton to $31 to $32 and $29 to $30 respectively.

Cleveland—Sentiment among dealers is decidedly bullish despite the absence of representative sales on which to peg firm prices. The recent mill purchase at Pittsburgh appears to be largely behind the better market tone. Lifting of the ban on scrap exports also is a factor.

Yards are holding their scrap at the moment and stockpiles are increasing. Brokers, meanwhile, are having difficulty covering on old orders at the currently quoted market levels, and they are reluctant to up their buying prices in the face of curtailed electric furnace operations.

Detroit — The scrap market here showed some strength last week as result of broker coverage. No mill purchases of size are noted.

Cincinnati—Prices quoted in the Cincinnati market reflect changes in other areas as there has been no local buying. Most items are up generally, with a $2 per ton rise being the most common. Rises of $1 a ton are few.

Chicago—The upward pressure on scrap prices continues with important grades up $1 to $2 per ton over a week ago. The market awaits an important test. This can come any day now when an important steelmaker purchases its November requirements. No. 1 heavy melting steel is appraised at $31, although some believe $32 as more accurate.

St. Louis—Stronger undertone has developed in scrap in response to eastern price increases. No new buying is reported locally.

Birmingham—Scrap remains inactive, current buying not sufficient to definitely establish price ranges.

Los Angeles—With mills displaying little interest in adding to scrap stocks, collections are tapering. In the face of continuing weakness in prices dealers are not stockpiling.

San Francisco — The lull in the steel scrap market continues. Dealers complain prices are too low.

Seattle—Scrap interests are pleased with the government decision to permit exports to friendly nations.

Sales by bid of offerings by the Puget Sound Navy Yard were reported, 400 tons unprepared at $26, 150 tons prepared at $27 to $28. In addition the buyers pay freight of $2.40 to their Seattle plants.

Boston—No. 1 heavy melting steel scrap is slightly stronger at $26 shipping point although this price is paid for steel 3-ft. and under. Other steel grades are firmer.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

435 tons, bridge structures, Agawam, Mass., to Haarmann Structural Steel Co., Holyoke, Mass.; Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

399 tons, bridge, Farmington river, Farmington, Conn., to Electric Boat Co., Groton, Conn.; Jarvis Construction Co., general contractor.

330 tons, substation steel, to Screw Machine products Co., Portland, Oreg. low $81,284 to Bonneville Power Administration.

300 tons, tower steel, to Bethlehem Pacific Coast Steel Corp., Seattle, low $81,524 to Bonneville Power Administration.

150 tons, state bridge, Westmoreland county, Pennsylvania, to Bethlehem Steel Co., Bethlehem, Pa.

150 tons, track scales, Pennsylvania Railroad, Philadelphia, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

140 tons, Pacific Lutheran College dormitory, Tacoma, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

105 tons, bridge, Merrimack, N. H., to Bethlehem Steel Co., Bethlehem, Pa.; R. J. Watkins Co., Amesbury, Mass., general contractor.

100 tons, bridge over New Haven railroad, Hamden, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Mariani Construction Co., New Haven, general contractor.

STRUCTURAL STEEL PENDING

25,000 tons, Newark Bay bridge, New Jersey Turnpike Commission, New Brunswick, N. J., bids Dec. 8.

11,800 tons, towers and cable anchorages, Philadelphia-Gloucester bridge over the Delaware river, Bethlehem Steel Co., Bethlehem, Pa., low bidder.

3500 tons, section, state expressway, Bronx, New York; bids Nov. 5.

3100 tons, municipal hospital, Newark, N. J.; Schacht Steel Construction Inc., New York, low on welded type construction, and Le-

(*Please Turn to Page* 200)

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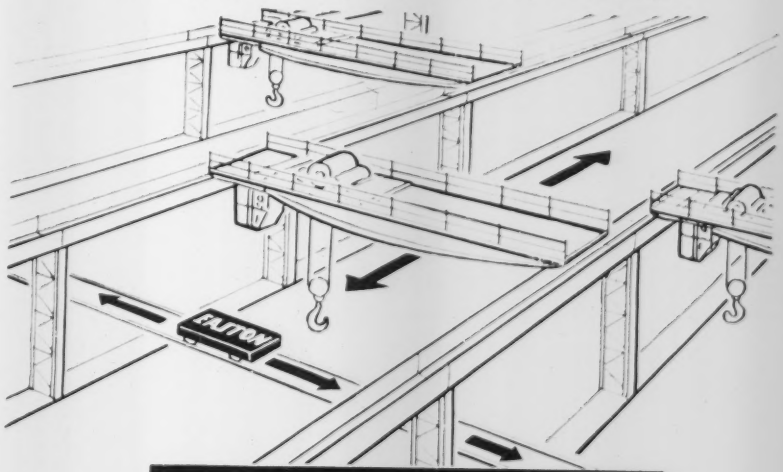

EASTON

A-1041

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Oct. 22	$32.83
Oct. 15	32.50
Sept. avg.	36.93
Oct. 1952	43.00
Oct. 1948	43.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	*31.00-32.00*
No. 1 bundles	36.00-37.00
No. 2 bundles	*29.00-30.00*
No. 1 busheling	36.00-37.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut structurals	38.00-39.00
Heavy turnings	29.00-30.00
Punchings & plate scrap	38.00-39.00
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	38.00-39.00
Heavy breakable cast	36.00-37.00
Unstripped motor blocks	33.00-34.00
No. 1 machinery cast	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	39.00-40.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Rails, random lengths	44.00-45.00
Railroad specialties	42.00-43.00

Stainless Steel Scrap

18-8 bundles & solids	165-170
18-8 turnings	90-95
430 bundles & solids	87-90
430 turnings	60-62

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	32.00-33.00
No. 2 bundles	22.00-23.00
No. 1 busheling	31.00-32.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	21.00-22.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Low phos.	32.00-33.00
Alloy free, short shovel turnings	24.00-25.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	28.00-29.00
Stove plate	36.00-37.00
Heavy breakable cast	26.00-27.00
Unstripped motor blocks	24.00-25.00
Brake shoes	28.00-29.00
Clean auto cast	45.00-46.00
No. 1 wheels	30.00-31.00
Burnt cast	29.00-30.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	36.00-37.00
R.R. malleable	45.00-46.00
Rails, 3-ft and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	42.00-43.00
Cast steel	41.00-42.00
Railroad specialties	41.00-42.00
Uncut tires	39.00-40.00
Angles, splice bars	44.00-45.00
Rails, rerolling	49.00-50.00

Stainless Steel

(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	nom. 50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	35.00-36.00
No. 2 bundles	29.00-27.00
Machine shop turnings	16.00-17.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Low phos.	35.00-36.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt	36.00-37.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	31.00-32.00
No. 2 heavy melting	29.00-30.00
No. 1 bundles	31.00-32.00
No. 2 bundles	27.50-28.50
No. 1 busheling	*34.00*
Electric furnace bundles	*45.00*
Machine shop turnings	19.00-20.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	26.00
Structurals & plate	36.00-37.00
Heavy turnings	30.00
Coilers, spring, wheels	41.00-42.00
Rail crops, 2 ft & under	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Charging box cast	nom.
Heavy breakable cast	38.50
Unstripped motor blocks	28.00
Drop broken machinery	40.00-41.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*23.00-24.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*21.00-22.00*
Machine shop turnings	*14.00-15.00*
Mixed borings, short turnings	13.50-14.00
Low phos. (structural & plate)	*29.50*
Short shovel turnings	*14.50-15.50*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips, solids	160.00-165.00
18-8 borings, turnings	90.00
430 sheets, clips, solids	80.00-85.00
410 sheets, clips, solids	70.00-75.00

BOSTON

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*25.00-26.00*
No. 2 heavy melting	18.50-19.00
No. 1 bundles	24.00-25.00
No. 2 bundles	16.50-17.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*31.00-32.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*31.00-32.00*
No. 2 bundles	*28.00-26.00*
No. 1 busheling	*31.00-32.00*
Machine shop turnings	*14.00-18.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Low phos., 18 in.	*39.00-40.00*

Cast Iron Grades

No. 1 cupola	42.00
Heavy breakable cast	*38.00*
Charging box cast	*38.00*
Drop broken machinery	46.00

Railroad Scrap

No. 1 R.R. heavy melt	*34.00-35.00*
Malleable	42.00-43.00
Rails, 18 in. and under	*48.00-49.00*
Rails, random lengths	*39.00-40.00*

CHICAGO

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 factory bundles	*31.00-32.00*
No. 1 dealer bundles	*28.00-29.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*30.00-31.00*
Machine shop turnings	14.00-15.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	16.00-17.00
Cast iron borings	16.00-17.00
Cut structurals, 3-ft	*38.00-34.00*
Punchings & plate scrap	*38.00-34.00*
Electric furnace bundles	*34.00-34.00*

Cast Iron Grades

No. 1 cupola	32.00-33.00
Stove plate	*26.00-28.00*
Unstripped motor blocks	19.00-20.00
Clean auto cast	36.00-37.00
Drop broken machinery	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt	*38.00-34.00*
R.R. Malleable	40.00-41.00
Rails, 3-ft and under	*45.00-46.00*
Rails, 18-in. and under	*47.00-48.00*
Angles, splice bars	40.00-42.00
Rails, rerolling	42.00-43.00

Stainless Steel Scrap

18-8 clips & solids	160.00
430 clips & solids	70.00
18-8 turnings	70.00
430 turnings	47.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	26.00
No. 2 heavy melting	23.00
No. 1 bundles	26.00
No. 2 bundles	23.00
No. 1 busheling	26.00
Machine shop turnings	12.00
Mixed borings turnings	12.00
Short shovel turnings	14.00
Punchings & plate scrap	30.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	33.00
Stove plate	34.00-35.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	40.00
Malleable	40.00

BUFFALO

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*34.00-35.00*
Machine shop turnings	*18.00-19.00*
Mixed borings, turnings	*21.50-22.50*
Short shovel turnings	*24.00-24.00*
Cast iron borings	*21.50-22.50*
Low phos.	*37.00-38.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*33.00-34.00*
No. 1 machinery	*39.00-40.00*

Railroad Scrap

Rails, random lengths	*41.00-42.00*
Rails, 2 ft and under	*46.00-47.00*
Railroad specialties	*44.00-45.00*

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Machine shop turnings	19.50-20.50
Short shovel turnings	20.50-21.50
Cast iron borings	20.50-21.50
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	41.00-42.50
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	nom.
Rails, 2-ft and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*29.00-30.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*29.00-30.00*
No. 2 bundles	*24.00-24.00*
Machine shop turnings	*13.00-14.00*
Short shovel turnings	*15.00-16.00*

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	*29.00-30.00*
Heavy breakable cast	*29.00-30.00*
Unstripped motor blocks	27.00-28.00
Brake shoes	*35.00-36.00*
Clean auto cast	37.00-39.00
Burnt cast	28.00-29.00

Railroad Scrap

Malleable	37.00-38.00
Rails, 18-in. and under	44.00-45.00
Rails, random lengths	*35.00-36.00*
Rails, rerolling	*41.00-42.00*
Uncut tires	31.50-32.50
Angles, splice bars	*35.00-36.00*

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	29.00
No. 2 heavy melting	24.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	12.00-12.50
Short shovel turnings	12.00-12.50
Electric furnace, No. 1	*36.00-38.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-30.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	26.00

Railroad Scrap

Rails, random lengths	34.00-35.00

SAN FRANCISCO

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
No. 1 busheling	24.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	13.00
Cast iron borings	13.00
Cut structurals	32.00
Heavy turnings	13.00
Punchings & plate scrap	33.00
Electric furnace bundles	24.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

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No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Machine shop turnings	7.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	37.00-40.00

HAMILTON, ONT.

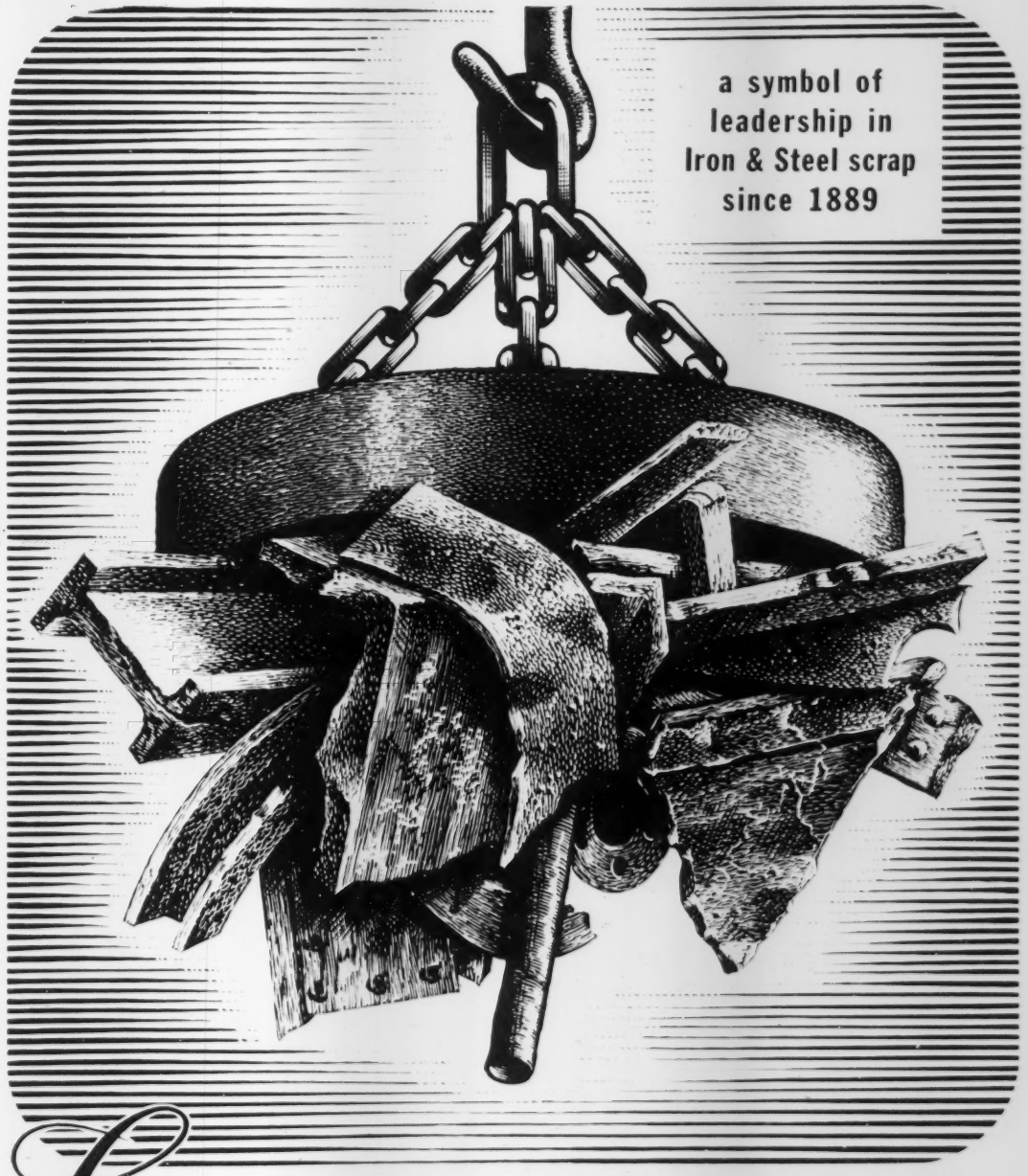
(Delivered prices)

Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	32.50
Mechanical bundles	28.50
Mixed steel scrap	28.50
Mixed borings, turnings	26.50
Rails, remelting	32.50
Rails, rerolling	41.50
Bushelling	26.50
Bushelling new factory:	
Prep'd	30.50
Unprep'd	28.50
Short steel turnings	22.50

Cast Iron Grades

No. 1 machinery cast	46.00-50.00

†F.o.b., shipping point.



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high Structural Steel Co., Allentown, Pa., low on riveted type.

1000 tons, bridge work, state thruway, Westchester county, New York; bids Nov. 5.

550 tons, four state bridges, route 128, Needham-Wellesley, Mass.; bids Nov. 3, Boston; also three reinforced concrete bridges in same section.

475 tons, four bridges and ramps, South End bridge, contract 3, Agawam-Springfield, Mass.; bid Nov. 3, Boston.

160 tons, state highway bridge, Billerica, Mass.; bids in, Boston.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, feeder canal repairs, Coulee dam, Washington; L. D. Shilling Co., Moses Lake, Wash., low $194,720; materials furnished by Bureau of Reclamation, Denver.

230 tons, garage, Marlborough-Blenheim Hotel, Atlantic City, N. J., to Concrete Supply & Steel Co., that city.

REINFORCING BARS PENDING

630 tons, junior high school No. 167, New York, to Lehigh Structural Steel Co., Allentown, Pa.

100 tons, 392-ft bridge, Douglas county, Oregon; bids to Bureau of Public Roads, Portland, Oct. 23.

PLATES . . .

PLATES PLACED

300 tons, also structurals, 165-car steel ferry, to Puget Sound Bridge & Dredging Co., Seattle, $1,658,732, delivery 380 days, by Washington (state) Toll Bridge Authority.

300 tons, anodic facilities, tanks and ventilation, to Flohr & Co., Seattle, by Boeing Airplane Co., Seattle.

PLATES PENDING

500 tons, or more, bulk fuel storage tanks, Ladd Field, Alaska; general contract to Morrison-Knudsen Co., Seattle, low $2,165,532 to U. S. Engineer.

100 tons plus, 3 million-gallon steel tank, also alternatives; bids to The Dalles, Oreg., Oct. 30.

PIPE . . .

CAST IRON PIPE PENDING

250 tons, 6000 ft 24, 20 and 16-in.; bids to Adah Perry, city clerk, Pasco, Wash., Oct. 29.

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32" x 23' centers, PITTSBURGH Lathe, Timken Bearings, two carriage with power traverse to each, late type.
30" x 14' American G. H. Lathe, 12 speeds.
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18" x 54" centers, Lodge & Shipley, late type, 24 spindle speeds, taper attachment.
16" x 8' American, 3 S C D, 56" center distance, 1¼" hole in spindle.
16" x 6' Lodge & Shipley, single pulley drive, 12 spindle speeds.
Gisholt 1L Saddle Type Turret Lathe, bar feed, late type.
Libby 3H Turret Lathe, 8" hole in spindle.
Cincinnati #2 Centerless Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Landis 26" x 168" Plain Cylindrical Grinder.
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Jones & Lamson 8 x 31 Thread Grinder.
Oliver Template Tool Bit Grinder.
Sellers 4 T Tool Grinder, motor drive.
Sellers 6 T Tool Grinder, late type.
Heald 42 Borematic.
King 42" Vertical Boring Mill, 2 heads.
Niles 36-44 Boring Mill.
Niles 42"—50" Driving Box Borer, Burnisher & Facer, late type.
Fellows #725 Gear Shaper, with spur guide.
Fellows 612 Spur Gear Shaper.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
American 5'-14" Column Triple Purpose Radial Drill, motor driven thru Turner gear box on arm.
American 4'-11" column Triple Purpose Radial Drill, motor driven thru Turner gear box on arm.
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Milwaukee 2 HL Plain Miller, Late Type.
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or
MANUFACTURERS REPRESENTATIVE

Mid-west steel fabricating, welding and machining concern is in need of a man who is qualified to sell the above services.

Established contacts in this field are essential.

This is an excellent opportunity for an ambitious and aggressive man.

Full or part-time arrangement will be considered.

Replies held in strict confidence.

State in first reply if you are interested in full or part-time position and enumerate your experience in this field.

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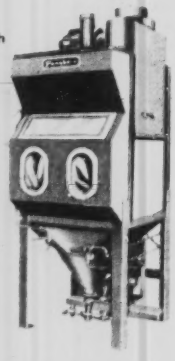

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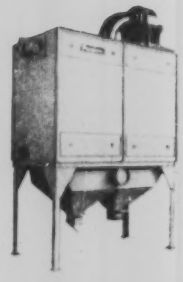

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continuous

buttweld pipe mills

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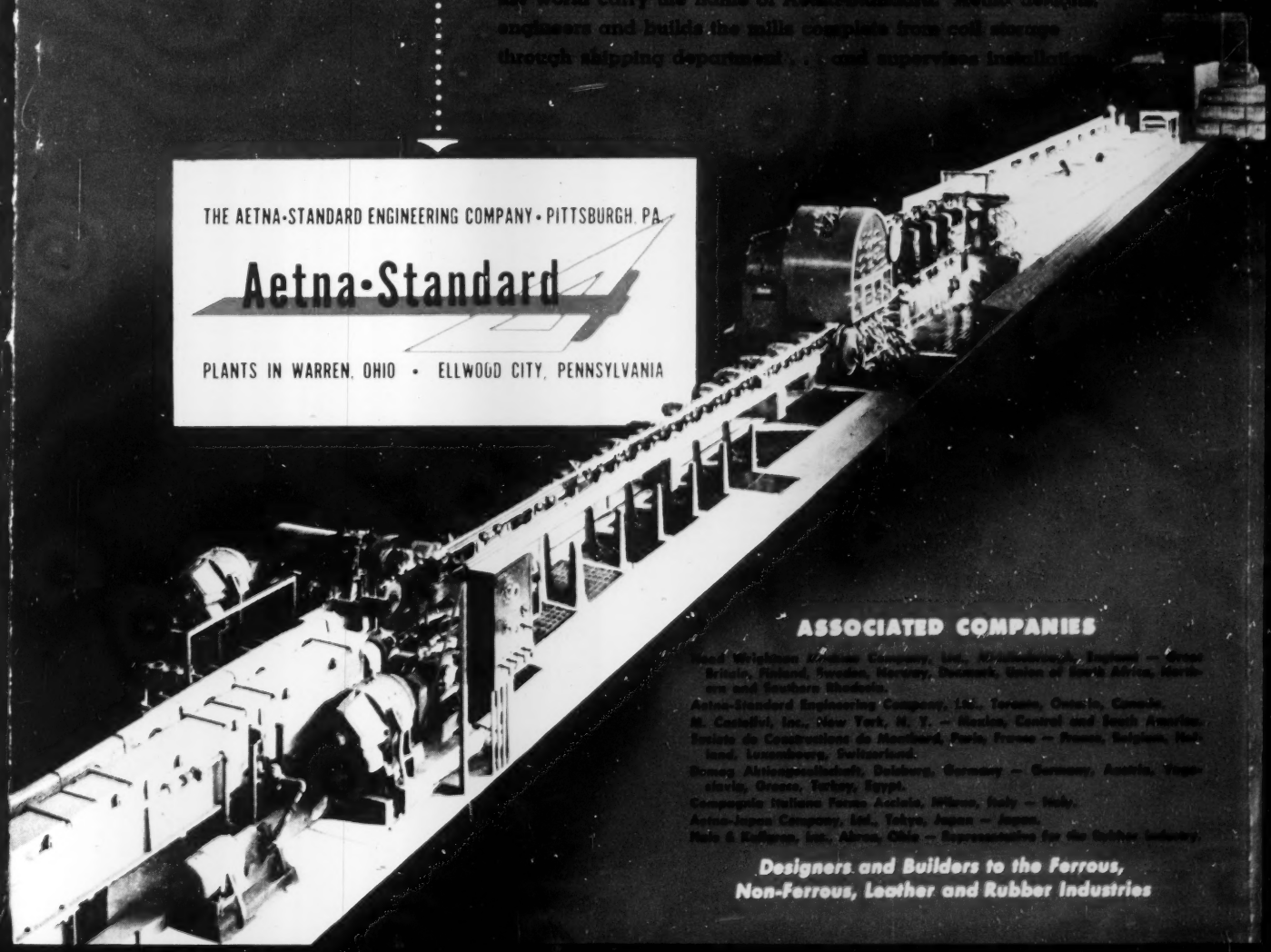

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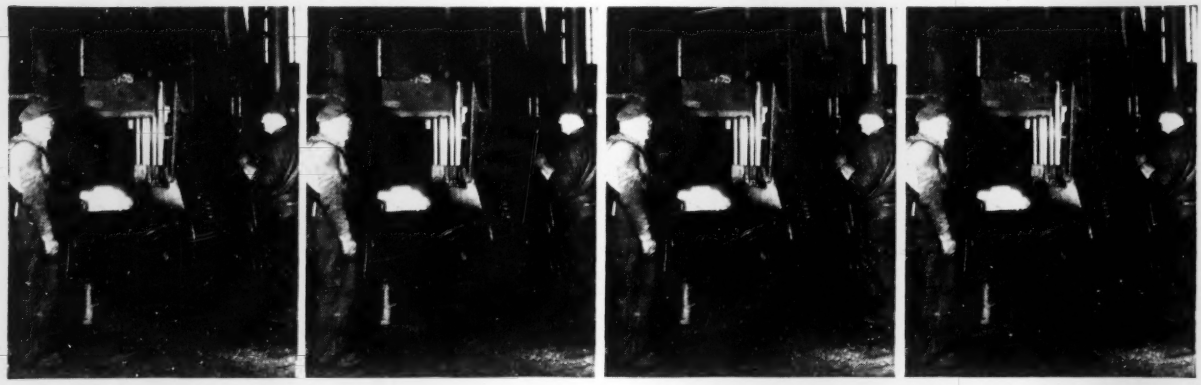
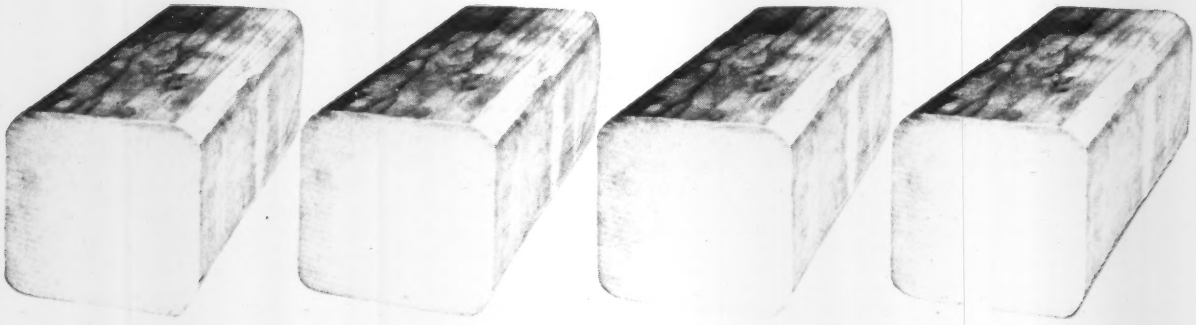


start with uniform TIMKEN® forging steels!



YOU can get uniform, high quality forgings and cut production costs too if you start by using uniform, high quality Timken® forging steels. With Timken forging steels, you're assured of uniform forgeability, uniform response to heat treatment, uniform machinability—from bar to bar and heat to heat. As a result, you have fewer rejects, fewer delays, fewer changes in shop practice.

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To learn how you can improve the quality of your forgings, cut production costs or both—get an "on-the-job" analysis by our Technical Staff. And for our bulletin No. 51, "Chemical Composition of Alloy Steels", write on your company letterhead to The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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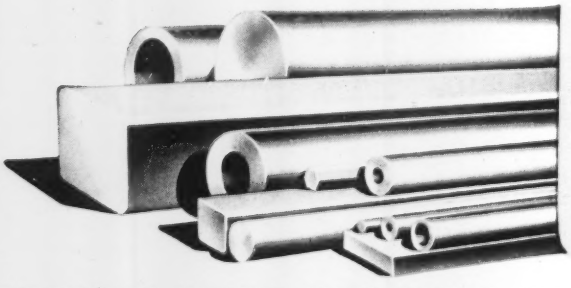

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